THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

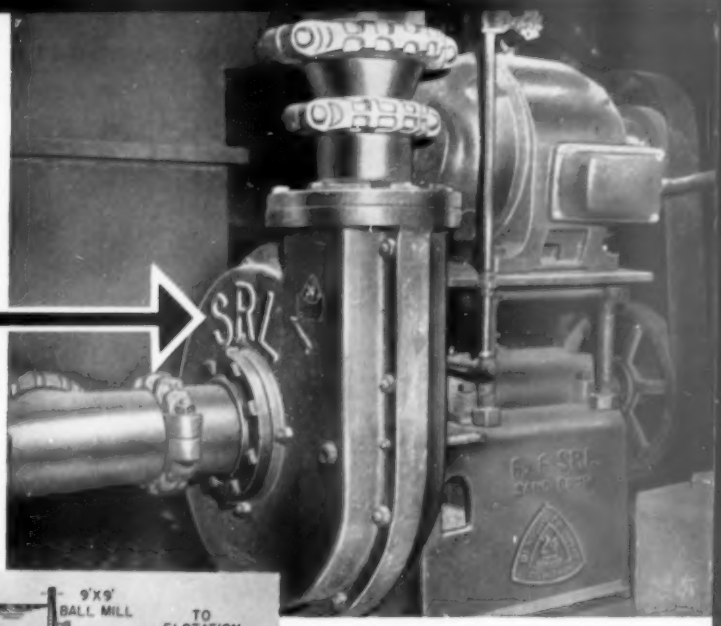
LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD

Three Screening Stations In 300 t.p.h. Gravel Plant page 78
Oil Boom Leads to Building of Cement Mill page 80
Blend Industrial Sands On Automatic Belt Conveyor page 108
Crushing-Haulage Changes Double Quarry Output page 134

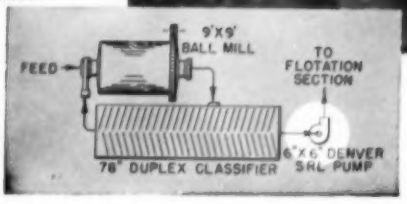
Aerial view of the new plant operated by Inland Cement Co., Ltd., Edmonton, Alta.

OCTOBER 1956

DENVER SRL PUMPS AT Climax



Here's why Climax Molybdenum Company has 44 Denver SRL Sand Pumps in it's modern, efficient mill



A 6"x6" Denver SRL Sand Pump operating at 690 r.p.m., handling 2200 tons per 24 hours of —28 mesh classifier overflow material at 45% solids. Life of pump runner and casing liner was 593,000 tons.

BACKGROUND

Originally, a 2"x2" Denver SRL (Rubber Lined) Sand Pump was installed on a trial basis at Climax to handle coarse, abrasive —28 mesh deslimed pyrite flotation concentrates. Later, Climax purchased one 6"x6" Denver SRL Pump to handle the problem described with the photo above.

RESULT

Operation of these original Denver SRL pumps was so successful that, as a direct result, 42 additional Denver SRL Sand Pumps have been installed in this outstanding mill. These new pumps vary in size from the 2"x2" SRL (Open Runner) to the 8"x6" SRL-C (Closed Runner).

REASON

The Climax operators have found the efficient, trouble-free operation of Denver SRL Pumps entirely satisfactory. Life of wearing parts is long and shut-down time minimized. Horsepower requirements have been low and high efficiencies have resulted. Obviously, the Denver SRL is a big success at Climax.

HOW DENVER SRL PUMPS CAN REDUCE YOUR PUMPING COSTS

Send full data to us today regarding your particular pumping problem. Experienced DECO engineers will evaluate your problem and will return correct and workable recommendations immediately. This will obligate you in no way.

We carry replacement parts for all sizes of Denver SRL Sand Pumps in our Denver stocks. This enables us to give you prompt service whenever you may need it.

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DECO 24 HOUR SERVICE DENVER EQUIPMENT COMPANY

"The firm that makes its friends happier, healthier and wealthier"

DENVER, NEW YORK, CHICAGO, EL PASO, SALT LAKE CITY, VANCOUVER, TORONTO, MEXICO, D.F., LONDON, JOHANNESBURG

DENVER EQUIPMENT CO., 1400 Seventeenth St., Denver 17, Colorado

B.F.Goodrich

B. F. Goodrich conveyor belt doubles production, cuts costs 40%

Nyfil fabrics give belts greater strength, yet cost no more

AT this big Pennsylvania plant, limestone used to be hauled to the crusher in cars drawn by a locomotive. But the system was too slow and costly.

A conveyor belt was considered. But the company was afraid that the heavy boulders crashing down on it would break the fabric reinforcement, would soon wear out the belt.

They talked it over with B. F. Goodrich engineers, who convinced them that there was a B. F. Goodrich belt that could take this abuse. The belt they recommended is made of B. F. Goodrich Nyfil fabric, so named because nylon is used as cross threads in the fabric to give extra strength without adding weight. B. F. Goodrich belts made with Nyfil are much stronger and so have greater impact resistance and hold fasteners better than belts made with cotton fabric.

The B. F. Goodrich belt, with Nyfil fabric, had been in use 18 months when the picture was taken, needed no maintenance, looks as if it would last five years more. It has increased production 100%, cut costs 40%, released four men badly needed for other work.

B. F. Goodrich belts, made with nylon-filled fabrics, have been in use many years now and are doing conveying jobs that were once considered impossible. Have your B. F. Goodrich distributor tell you *all* the advantages of belts made with Nyfil, or write *B. F. Goodrich Industrial Products Company, Dept. M-753, Akron 18, Ohio.*

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30x36 Rock-Ram crushing plant in Ohio includes Lippmann feeder, conveyors, screens, pulverizer and bins.

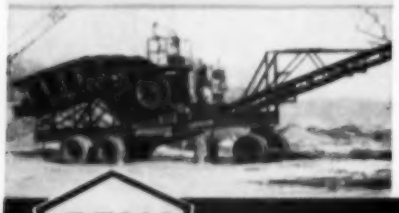
IT'S THE BEST CRUSHER INVESTMENT I'VE EVER MADE...

"We have operated our Lippmann Crushing Plant for almost a year now and your 24 x 36 Rock-Ram jaw crusher mounted on it is a real rock breaker. It requires practically no attention, uses little power and will take all we can give it and more. It's the best crusher investment I've ever made."

(signed)
WILMER GERDES,
owner
GERDES QUARRY,
Dixon, Ill.

10x36 Rock-Ram crusher in a stationary crushing plant in Illinois. Also includes Lippmann feeder, conveyors and screens.

20x36 Rock-Ram mounted on primary plant with feeder and conveyor, in an Illinois pit.



Mr. Gerdes' praise of his Lippmann Rock-Ram is typical of the pride voiced by Rock-Ram owners everywhere. And with good reason — for each has a machine that, pound for pound, is the strongest crusher built. And better than this are other Rock-Ram advantages . . . heavier flywheels and greater crushing-stroke eccentricity to give more impact and bigger bite for greater production and lowest power usage . . . larger shaft and oversize roller bearings that assure longer uninterrupted service with less chance of the shaft and bearing failures that makes ownership of ordinary crushers so expensive. The feed opening is specially engineered larger with size measured at the closed stroke of the eccentric instead of the open. This gives Rock-Ram owners the added bonus of a greater-than-specified opening size.

The Rock-Ram owner also knows that his crusher has many of the same superior crushing advantages of the famous Lippmann Grizzly-Kings — but at Rock-Ram's lower cost. Small wonder that Mr. Gerdes says, "It's the best crusher investment I've ever made."

Rock-Rams are made in sizes 10" x 16" to 30" x 36". Bulletin 1111 contains full information on these superb crushers. Contact your Lippmann Distributor, or write to Lippmann Engineering Works, Inc., 4605 W. Mitchell St., Milwaukee 14, Wis.

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LEW **LIPPMANN**

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ROCK

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PRODUCTS

OCTOBER 1956

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A Look Behind the Iron Curtain

Russia expects to boost cement production to 322 million bbl. by 1960, using more modern machinery and techniques

Heavy Media Solves Problem for Southern Pacific Milling Co.

Get rid of undesirable minerals in raw material and produce high grade gravel products in new $500,000 plant

Cut Highway Bridge Costs with Prestressed Concrete

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Why Monterey Sand Co.'s CAT D6 Tractor is*

THE CHOICE OF EXPERIENCE

This D6 has a lot to live up to. Its predecessor, another Caterpillar Diesel Tractor, worked 10,000 hours before it needed an overhaul. On the strength of this performance, Monterey Sand Co., of Monterey, Calif., bought the D6.

The new D6 works 16 hours a day, six days a week, stockpiling and loading sand used for sandblasting and filtration. After a little more than 1000 hours on the job, how does it measure up to its rugged predecessor? "We're delighted with the D6, and with the service from our local dealer," says Robert E. McDonald III, a partner in the firm.

The Caterpillar D6 Tractor is built to outlast and outwork any other tractor in its class. On tough jobs in pit or quarry, Caterpillar's exclusive oil clutch cuts costs. It reduces the need for clutch adjustments, prolongs clutch life, and steps up operator efficiency because it provides easier shifting.

The D6's Caterpillar-built four-cycle diesel engine develops 75 drawbar HP—and can do it efficiently and without fouling, thanks to its simple and tinker-free fuel injection system. Other long-life features include hardened track shoes to stand up to hard work around rock, and highly efficient filters and seals that keep lubricants *in* and grit *out* of engine and running parts.

The D6 is available with straight or angling bulldozer blade to fit *your* operation. Your Caterpillar Dealer—who provides prompt, skilled service and parts you can trust—will be glad to demonstrate. Give him a call today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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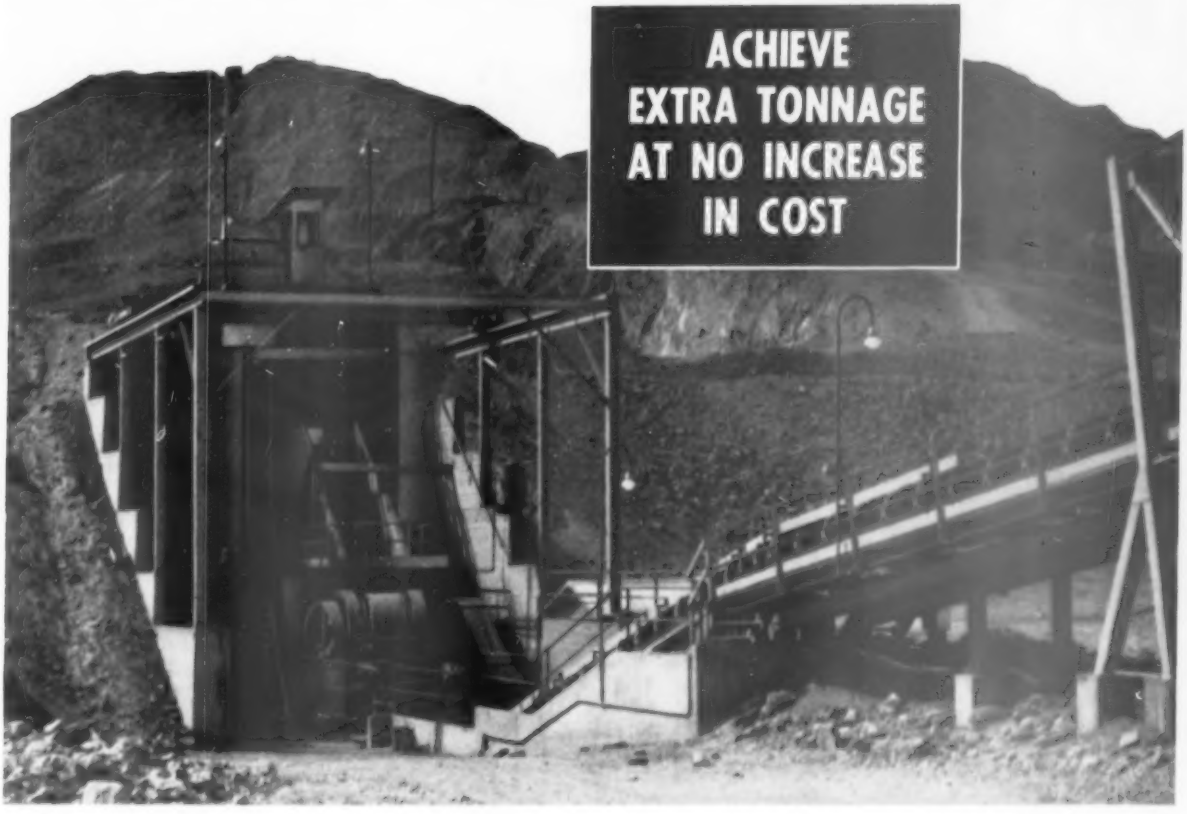
Get a Better Break on Stone Reduction with

TRAYLOR JAW CRUSHERS



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The massive construction of Traylor Jaw Crushers stands up to the heaviest round-the-clock production schedules with less down-time and lower maintenance costs. Available in 5 types and 33 sizes with feed openings from 8″ x 12″ to 60″ x 84″, Traylor Jaw Crushers provide you with the capacity for crushing from 4 to 1,000 tons of rock per hour.

Write today for your copy of bulletin 11-120 which describes and illustrates many cost cutting features of Traylor Jaw Crushers.

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at Alabama Aggregate Company

(Below) Part of the fleet of hauling units operated by the Alabama Aggregate Company, Fortson, Ga. (Right) R. E. McWaters, Superintendent, shows Gulf Sales Engineer Charles J. Cason, Jr., a connecting rod from the engine of the diesel electric set that provides electric power for the plant. Recently disassembled for inspection, all parts of this engine were found to be in excellent condition after over 7000 hours of continuous operation with Gulf Super-Duty Motor Oil.

Ask the Alabama Aggregate people—and many other progressive organizations in the industry—why they prefer Gulf products, and you'll probably get an answer something like this: "Gulf lubricants provide an extra margin of protection for equipment, keep maintenance costs at rock bottom levels. Gulf fuels help us to get top engine performance because they burn evenly and completely. And Gulf's cooperative engineering service helps us select just the right fuels and lubricants for every piece of equipment."

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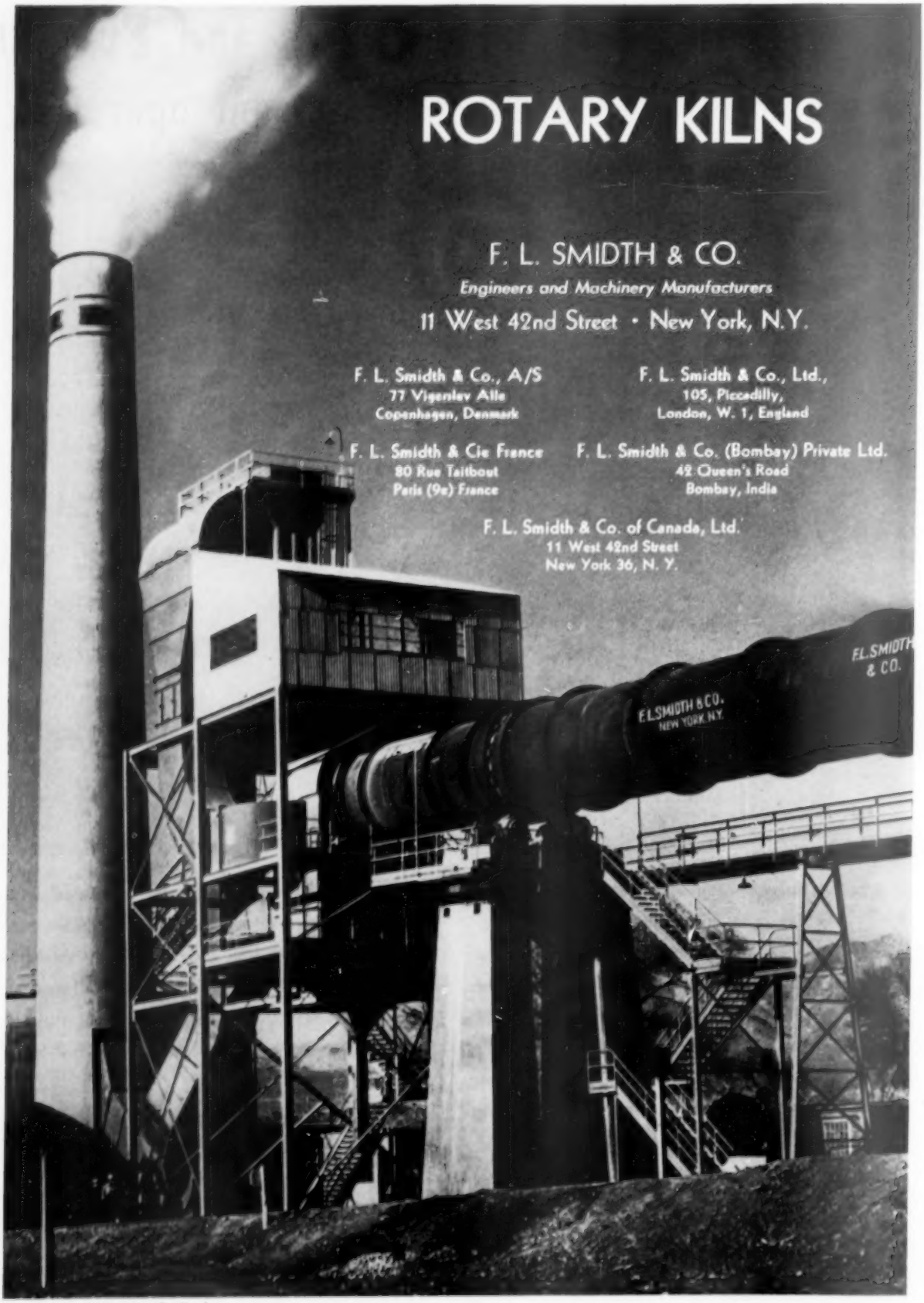
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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

October, 1956

Radioactive pebbles are being used by three British scientists to determine the underwater movement of coarser beach material. Inserting Barium 140 into small cavities drilled into 2-in. dia. pebbles, the research team dumped the stone 500 yards seaward off Scolt Head Island in Norfolk. Three days later, some were traced as much as 200 ft. shoreward, and successive tracking with Geiger counters showed the pebbles to be moving steadily and slowly inshore. The scientists, reporting their findings in **Nature**, suggest that the action of the current along with the waves might cause the pebbles to move along the sea bottom. C. Kidson of the Nature Conservancy, D. B. Smith of the United Kingdom Atomic Energy Authority and J. A. Steers of the department of geography at the University of Cambridge are the men who hope to aid coastal physiographical study by working out this technique.

Styrofoam plastic foam insulation is finding increasing use in perimeter and other types of construction. Weighing 2.4-oz. a board foot, it speeds up handling and placement on the job, and is especially adaptable to masonry construction as it can be mortared to block or brick and plastered directly, thus eliminating furring and lathing, with the exception of corners, arches, etc., where corner beads are stapled or pressed into the Styrofoam. It is used to insulate foundations, slabs, floors, walls, ceilings and roofs. For use under concrete slabs it is simply laid on solid fill and the concrete is poured over it.

Retaining walls of precast units have been used in the construction of a road near Naples where the gradient transversely to the direction of the road is steep and the ground loose. The wall was built on a foundation of stones placed in iron baskets, or gabions. Two types of units were used; Y-shaped units provided the base, and longitudinal slabs formed the face of the wall. Interlocking lugs on the units were fastened by passing steel bars vertically through the holes. Curved units were made for curves in the road of less than 90-ft. radius, and the Y-shaped units were adjusted accordingly.

Quartz and jasper aggregates were selected for use in precast facings being made by a Utah manufacturer for a department store in a Chicago suburb. The diamond-shaped slabs, averaging in size 8- x 17-ft., are made with approximately 1-in. facing of quartz and jasper, and with a lightweight perlite concrete backup to provide insulation. Over 500 of the large pieces are being used, as well as a number of smaller ones.

Release from his concrete prison proved overwhelming for an Oklahoma toad. A wrecking crew breaking open a concrete block from a bank building erected in 1907 found the toad inside. They offered the ancient amphibian several juicy insects which he surveyed gravely before giving up the ghost.

Not to be neglected on payday are the crews of 200 barges operating up and down the Hudson River for the New York Trap Rock Co. The 85-mile course over which the barges travel is efficiently served on payday by a helicopter.

Sintox, a new ceramic developed in England and for which the Sintox Corp. of Allentown, Penn., holds American rights, is being tested as a cutting tool on the new metallurgical products, such as titanium-columbium alloys, which are difficult to machine. A Sintox tool was able to make a 14-in. cut before being replaced, as compared to a 4-in. cut made by carbide tools. It is also much cheaper to produce than the tools currently used. The hardness of the new ceramic, plus its ability to withstand high temperatures and corrosive chemicals, are also pointed to its use in electronics and chemistry. Possible uses are in dental drills, thread guides for synthetic textiles and as a substitute for mica.

The Blue Ridge Hills of North Carolina are enjoying a boom as the result of the Federal mica purchasing program. Taking no chances of again being caught short of the material as it was when cut off from Indian supply by the Japanese during World War II, the government is stockpiling the mineral in a depot at Spruce Pine, N. C. Since stockpiling was begun, more than $7.5 million of mica has been bought. Prospectors and engineers have been lured to the area, having the bulk of mica deposits in this country, by the prices being paid for the commodity—$70 a lb. for top grade red ruby mica.

A variety of uses for plastic pipe are increasing its market in home and industry use. For example: the lightweight corrosion-resistant product has been selected by federal supply specialists to bring water to Indian reservations; H. J. Heinz Co. uses it to carry vinegar in its bottling operations; Dixie Cup Co. shoots paper cups through the transparent tubing from the machines which make them to its packing room. In addition, coal mines have converted to plastic for draining corrosive liquids, and oil-well gathering lines put it to steady use. Home water-softening equipment also is employing the versatile tubing.

In the mountains of New Mexico, the U. S. Air Force will build a large solar furnace that, under ideal conditions, may attain radiation temperatures of 7000 to 8000 deg. F. Located near Holloman Air Development Center, Alamogordo, N. M., the furnace will be used for high temperature research and testing of materials and weapons components. It will duplicate as far as possible thermal effects of nuclear weapons on various materials, and will furnish a setting for high temperature research in chemical reactions.

Something new in Gothic arches are the nine giant roof supports of a Denver church now under construction. The arches are being precast in reinforced concrete. Each arch is poured in two pieces, like the legs of a letter "A". The 9-ton units, when raised in place, are joined together by the welding of steel plates cast into the concrete.

Danish flint, transformed in kilns at a temperature of 1000-deg. C., is being viewed as an important road-making material, according to the **Danish Foreign Office Journal.** The grains are pulverized, then consolidated by means of asphalt. As the road face is worn, it becomes bright, and so reflects the light of car lamps.

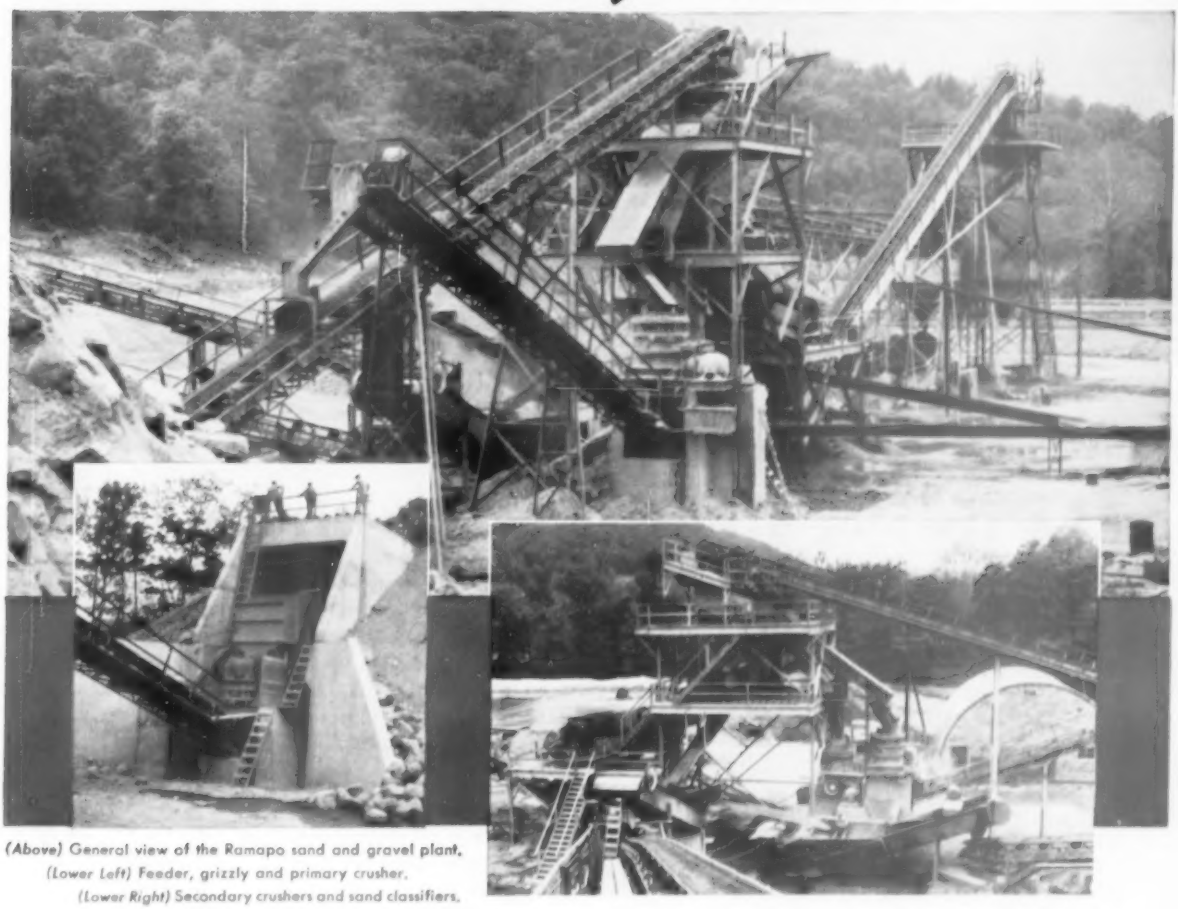
Heavy construction awards, nationally, totalled $15 billion for the first 35 weeks of 1956, as reported in **Engineering News-Record.** This was an increase of 19 percent above the corresponding period in 1955.

THE EDITORS

for heavy construction programs

COMPLETE TELSMITH® PLANT

meets all requirements



(Above) General view of the Ramapo sand and gravel plant. *(Lower Left)* Feeder, grizzly and primary crusher. *(Lower Right)* Secondary crushers and sand classifiers.

Near the New York Thruway, and close to many other heavy construction jobs, this complete Telsmith plant meets all their aggregate requirements. Built by Ramapo Sand & Gravel Co., Ramapo, N. Y. and designed by Telsmith engineers, it has Telsmith equipment throughout. It makes three sizes of gravel, and concrete and mason sand, all washed. Be sure that yours is a profitable Telsmith plant. Send for Bulletin 266.

ALL Plant Equipment is TELSMITH

36″ x 6′ Heavy-Duty Plate Feeder • No. 540 Rotary Grizzly • 18″ x 30″ Jaw Crusher • 36-S and 367-S Gyrasphere Crushers • 5′ x 14′ Double Deck Scalper Dry Screen • 5′ x 14′ Double Deck Vibro-King Wet Screen • 60″ x 18′ Rotary Washing Screen • Two 4′ x 12′ Triple Deck Vibro-King Finishing Screens • 24″ x 20′ Twin Screw Sand Classifier • 30″ x 25′ Twin Screw Sand Classifier • Eight Telsmith-BG Belt Conveyors: 30″, 24″, 18″ wide, total length 892′.

G-24

SMITH ENGINEERING WORKS

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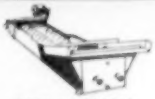
Send for YOUR Copy of new 44-Page Catalog 55.

THE EAGLE LINE

COARSE MATERIAL WASHERS


FINE MATERIAL WASHERS

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EDITOR'S PAGE

Expansion – A Must

IF THERE'S STILL SOME QUESTION about the need for long-range expansion in the rock products industry, a look at new construction-activity figures may help to give you the answer.

Total private construction this year ($31 billion) will barely top that for 1955—by one percent. The only slow-down is in new housing. Even so, value of new housing this year will beat that of 1954 by 15 percent, so the two-year trend is up.

The rest of the picture looks real rosy! Value of new factories, office buildings, stores, etc. this year is up 18 percent over 1955. It's up 53.5 percent above 1954.

Public construction is slated to be up 9 percent over last year, but 18 percent above 1954. Highway building, of course, shows a big rise—up to $5.15 billion this year. That's 14 percent over last year and 46 percent above the 1954 level.

Looks pretty good, doesn't it? But here's the point we're trying to get over. Our industry's future is not wholly dependent upon the new highway program for growth. Surely, the program will be a pretty good shot in the arm for the next decade or so. But we can't afford to overlook the projected rise in other new-construction markets.

The big move of population to the suburbs continues, and this is important to our industry. Data for 1954—latest available—prove the trend. Nearly half of all building permits that year were for construction in city suburbs. More than half of all new factories, 40 percent of stores and 25 percent of office buildings were built in outlying areas of cities in 1954.

The new highway program, in fact, will give a boost to new construction all around. As the new roads are built, the shift in population from cities to suburbs and urban areas will be quickened. New housing areas will grow up along the new roads—farther and farther from congested cities. They will need new roads and streets, water and sewer mains, shopping centers, schools, hospitals—all the modern facilities that go along with new population centers. Add to this the fact that we'll simply need more facilities for more people—population is growing faster than scheduled—and the answer in need for rock products becomes fantastic.

It appears that expansion needed now to supply materials for the road program will be needed to supply other construction when federal road building tapers off. We wonder if the industy knows just how bright the future is—and what a big job lies ahead for producers.

George C. Lindsay

LOOK TO THE ALLIS-CHALMERS LINE . . . TO

Match the needs of your tractor

If you're looking for big capacity, mobility and wide-range versatility — at low cost — the tractor shovel you need is in the Allis-Chalmers line.

First — advanced-design features make Allis-Chalmers tractor shovels the most productive and widely accepted in earth-moving and material handling fields. Second — each unit offers a shovel that's a built-in part of the tractor — not just an attachment. Third — you have a choice of four sizes to match the needs of your jobs most efficiently.

You can increase Allis-Chalmers tractor shovel usefulness even more by replacing the standard bucket with a variety of quick-change attachments, such as a light materials bucket, rock bucket or rock fork . . . or by adding a rear-mounted ripper.

On every job, your Allis-Chalmers tractor shovel provides all these important advantages for you and your operator:

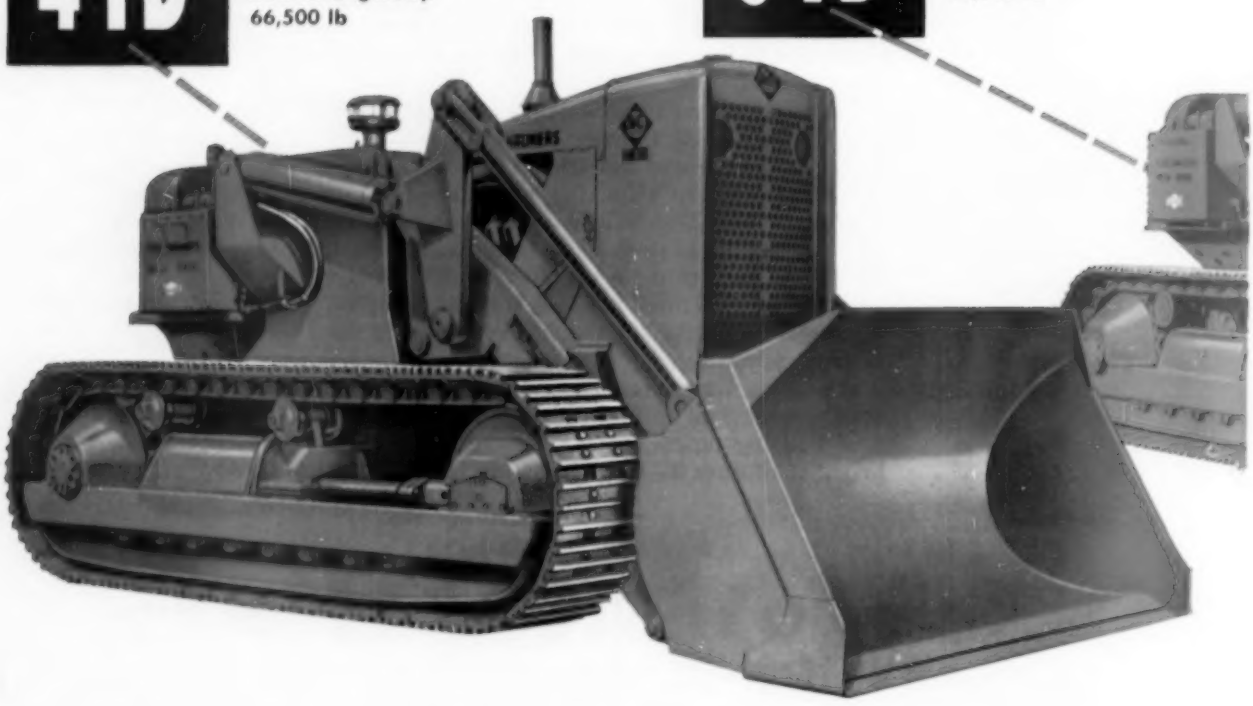
- Superior balance and low center of gravity
- Sure-footed stability with extra long track
- Greater strength with heavy, welded-steel shovel, side frames and low stabilizer
- Bucket design that makes loading and dumping fast, clean and easy
- Simplified hydraulics with 3-way, full-flow filtering
- Powerful, long-life Allis-Chalmers diesel engine
- All-steel main frame and one-piece final drive and steering clutch housing
- Timesaving service simplicity
- Heavy-duty roller bearing truck wheels
- 1,000-hour lube intervals on truck wheels, idlers and support rollers
- Better visibility, comfortable seats, and easy operating, accessible controls

4 YD

HD-21G
torque converter drive
13-ft, 4-in. dump height
204 net engine hp
66,500 lb

3 YD

HD-16G
torque converter drive
12-ft, 3-in. dump height
150 net engine hp
47,800 lb



shovel jobs

1½YD

HD-6G
10-ft dump height
72 net engine hp
19,600 lb

2¼YD

HD-11G
11-ft, 7-in. dump height
110 net engine hp
32,000 lb

Ask your Allis-Chalmers Construction Machinery dealer for the complete story and for a look at one of these great tractor shovels at work. And remember, your dealer is headquarters for factory-trained servicemen, factory-approved facilities and complete stocks of True Original Parts.

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NO "TIME OFF" IN EIGHT YEARS

Working 40 hours a week the year around, the CAT* D13000 Engine in this 1½-yd. Marion shovel has had *no major repairs in eight years.* It provides steady, dependable power for loading out 700 tons a day of limestone cement rock for Ideal Cement Company at its quarry near Northport, Washington. This operation was formerly under direction of Spokane-Portland Cement Co.

Now there is a successor to the D13000. It is the new Caterpillar D342, which can produce more power (210 HP—maximum output capacity) from the same engine size. And it has the traditional advantages of rugged four-cycle Caterpillar construction. There are no air boxes or cylinder ports to clean in Caterpillar Engines. Their Caterpillar-built fuel injection systems need no tinkering, and remain free from fouling even when the engine idles for long periods of time. And—a money-saving "plus"—all Caterpillar Engines can deliver full power on non-premium furnace oil.

These trouble-free diesels have such features as "Hi-Electro" hardened crankshafts with Superfinished bearing surfaces, aluminum alloy bearings, and effective fuel, air and oil filters to keep out engine-wearing abrasives. Leading manufacturers install Caterpillar Engines as original power in their equipment. And your Caterpillar Dealer can install one of these sturdy yellow engines in your present equipment.

Your Caterpillar Dealer has all the facts and figures on the broad Caterpillar line of engines capable of producing up to 650 HP (maximum output capacity). See him for *proof* that a Caterpillar Engine or Electric Set can do *more* work for a *longer* time at *lower* cost on *your* job. And count on him for trained service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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MODERN
HEAVY-DUTY POWER

KENNETH A. GUTSCHICK

N.L.R.B. Decision on Jurisdiction over Multiple-company Operation

JURISDICTION over three separate but commonly-owned concrete products corporations was the subject of a recent National Labor Relations Board case. The decision is of special interest to our readers, since the operation of multiple plants or multiple companies is common in the rock products industry.

This case involved Clark Concrete Construction Corp., Idaho Falls, Idaho, Concrete Products, Inc., Rupert, Idaho and Idaho Concrete Products, Inc., Pocatello, Idaho, *and* Teamsters, Chauffeurs, Warehousemen and Helpers Union No. 983, Operating Engineers, Local 370, AFL-CIO, et. al., dated July 27, 1956. The hearing officer was O. W. Turnbaugh before Mr. Leedom, chairman, and members, Murdock, Peterson, Rodgers, and Bean.

The Board decided that the three corporations do not constitute a single employer for jurisdictional purposes, even though they have the same majority stockholders and common officers. The decision was based upon the three plants manufacturing different products, being physically separated, having separate supervision, labor policies, record keeping and payrolls, and there being no employe interchange. But the Board did assert jurisdiction over Clark Concrete Construction Corp., in view of this firm selling a substantial amount of merchandise (about $83,000) outside the state annually (although it did not have sufficient direct or indirect inflow). The two other corporations lacked sufficient outflow and inflow to warrant assertion of jurisdiction in this case.

Facts in the Case

According to the N.L.R.B. report, Clark Concrete Construction Corp. operates a plant at Idaho Falls which has 47 employes and manufactures cinder block and concrete products. Idaho Concrete Products, Inc., operates a plant at Pocatello which has eight employes and manufactures concrete pipe, headgates and septic tanks. Concrete Products, Inc., operates a plant at Rupert which has 12 employes and manufactures concrete headgates and farm irrigation pipe.

Merland Clark, his wife, Opal Clark, and Bill Holden, are, respectively president and majority stockholder, secretary-treasurer, and a director of each corporation. The Idaho Falls plant sells block at wholesale to the other two plants, for resale to their customers. Each plant makes some retail sales. The Idaho Falls plant is about 50 miles from the Pocatello plant and about 120 miles from the Rupert plant, and the last two plants are about 72 miles apart.

Mr. Clark maintains his office at the Idaho Falls plant, and such supervision as he exercises is confined to that plant "practically all of the time". Generally, however, each plant is under the separate supervision of its own general manager, who hires and discharges employes, and controls labor policy at his particular plant. There is little or no interchange of employes among the three plants. The general managers and Mr. Clark occasionally have business meetings together and occasionally one plant will rent equipment to another for which a charge is made. Advertising is on a single-plant basis, except television advertising. The office manager of the Idaho Falls plant audits the books of the other two corporations. He may suggest better accounting methods or be consulted as to the price changes, but has no supervision over office employes at the other plants. Each plant has its own office and bookkeeper and keeps separate records and payrolls. They are therefore not so integrated as to constitute the three corporations operating them as a single employer for jurisdictional purposes.

The report also states that during 1955, the Idaho Falls, Pocatello, and Rupert plants bought merchandise valued at about $435,000, $80,000, and $65,000, respectively. During 1955, the Idaho Falls plant sold merchandise valued at about $1,000,000, of which about eight percent represents merchandise delivered to customers outside Idaho. During the same period, the Pocatello plant sold merchandise valued at about $300,000, of which about $500 represents merchandise delivered outside Idaho and Rupert plant sold merchandise valued at about $250,000, all of which was delivered within Idaho.

Decision

The Board concluded, "With respect to inflow, even if all the purchases of the individual plants during 1955 are regarded as interstate purchases, none of the plants had sufficient direct or indirect inflow to warrant assertion of jurisdiction by the Board on this basis.[4] With respect to outflow of the three plants, only the Idaho Falls plant had sufficient outflow to warrant assertion of jurisdiction.[5] We therefore find that the Clark Concrete Construction Corp., which operates only the Idaho Falls plant, is engaged in commerce within the meaning of the Act, and that it will effectuate the policies of the Act to assert jurisdiction over this corporation. We also find that it will not effectuate the policies of the Act to assert jurisdiction over Idaho Concrete Products, Inc., or Concrete Products, Inc., which operate the Pocatello plant and the Rupert plant, respectively."[6]

Dissenting Opinion

Murdock and Peterson, members, (dissenting in part) "We disagree with our colleagues' conclusion that the three corporations named as the Employers herein, do not constitute a single employer. In our opinion such a conclusion can be supported only on the highly unrealistic conclusion that Merland Clark, the majority stockholder and president of each of the three corporations, exercises little or no control over the conduct of the operations of each of the corporations. Such a conclusion is clearly contrary to the record considered as a whole.*** Clark as president, majority stockholder, and director of the corporations, obviously is in a position to control the policies of each of the corporations. The fact that he has delegated to his general managers wide latitude in the day to day operations of the plants does not establish that the plants are so independent and free from control by the central and paramount authority reposed in Clark as to justify a finding that they are separate distinct business entities as found by our col-

(Continued on page 154)

4. Jonesboro Grain Drying Cooperative, 110 N.L.R.B. 481.

5. Jonesboro Grain Drying Cooperative, supra.

6. Contrary to our dissenting colleagues, we make this finding independently of any unit considerations.

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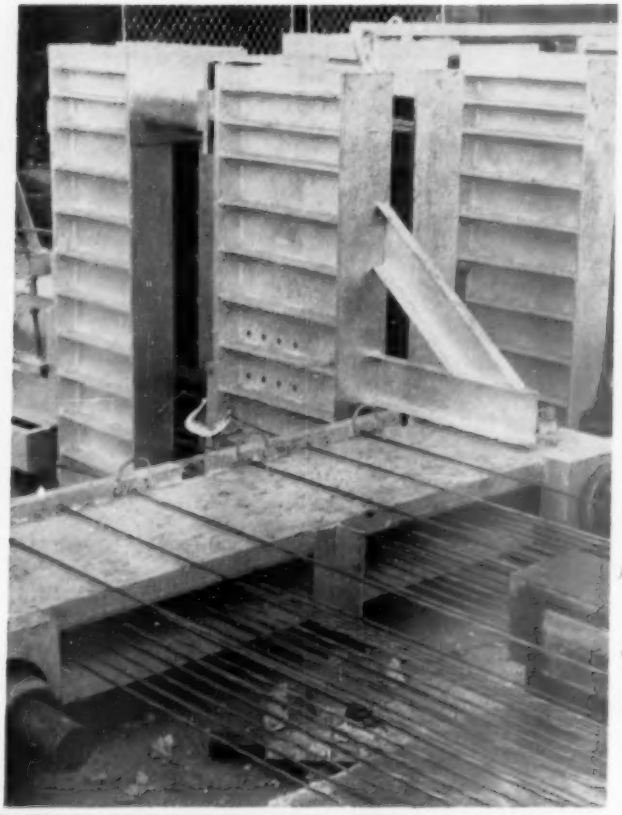
3 WAYS TO BUILD WITH



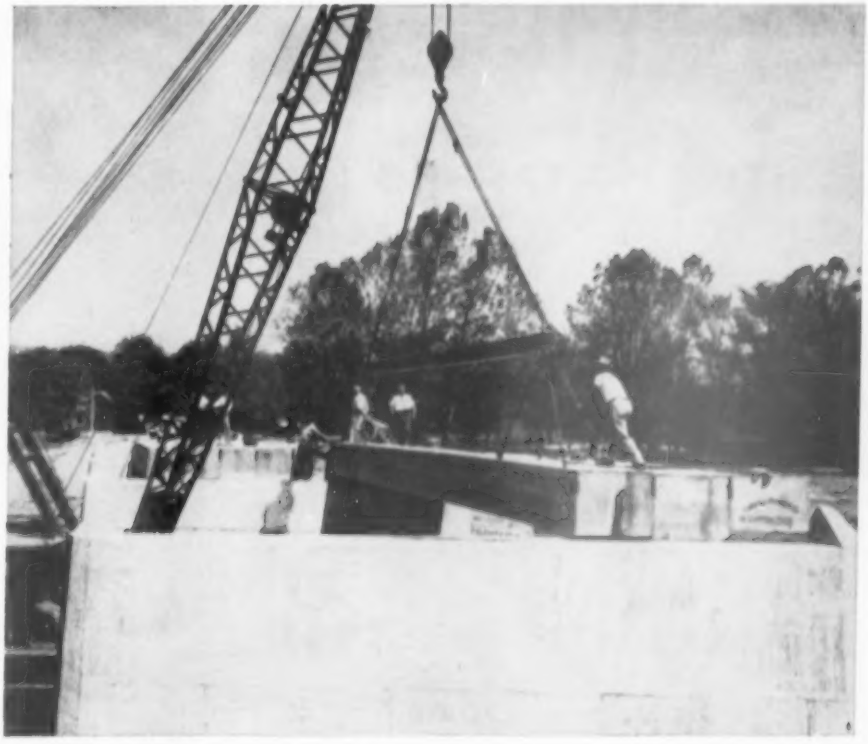
* FIRST OF ITS KIND

This Lincoln Tunnel Retaining Wall was designed and built by the Port of New York Authority. A maximum of 50 feet high, the wall consists of concrete piers poured in place with slots in the sides. Precast, prestressed panels are dropped into these slots to form the wall. This is the first use of this type of construction in the United States. The panels are 4 feet wide and either 12 inches or 18 inches thick. They are pretensioned to 175,000 psi, with thirty-two or forty-six ⅜" diameter American Special High Strength Stress-Relieved Strands. Panels were manufactured by Precrete, Inc., Astoria, Long Island.

* TWO MODERN IDEAS AND ONE OLD

American Welded Wire Fabric has been used for more than 30 years to reinforce all types of concrete construction. American High Strength Stress-Relieved Strand for prestressed concrete, a high-quality product developed expressly for this application, is now also being used extensively in all types of construction. A typical installation is this large shopping center at Roosevelt Field in New York, where precast welded wire fabric reinforced channel slabs combine with precast *prestressed* slabs to make a better building. The reinforced slabs, 16 feet long, use American Welded Wire Fabric, 3" x 8"—3 gage x 8 gage. The prestressed slabs, in lengths of 27', 31'-6", and 33'-6", are pretensioned with American High Strength Stress-Relieved Strand. This is a Webb & Knapp project, designed by Boehler and Bugnoni. Structural Engineers were Severud-Elstad-Krueger of New York City. Slabs were manufactured by Precrete, Inc., Astoria, Long Island.

PRESTRESSED CONCRETE



• CUTS COST

The prestressed beams for this concrete bridge in Pennsylvania cost far less than conventional built-in-place members of equivalent strength. They were pretensioned with American High Strength Stress-Relieved Strand. Prestressed concrete often saves money because it can be precast on an assembly-line basis at a factory. In addition, prestressed members take less concrete and steel because the high strength steel is stronger and does "more work" per pound used. And prestressed members can be installed more quickly.

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Gain 3 Ways

IN ROTARY KILN OPERATION WITH L&N SYSTEM ENGINEERED CONTROLS

1. ***Stabilize quality*** . . . by accurately and automatically controlling such important variables as temperature, draft, fuel flow . . . preventing "off spec" overburned "ball ups" and underburned rejects.

2. ***Increase production*** . . . by permitting maximum safe operating tempera· e without refractory damage . . . maximum safe speed without lowering product quality.

3. ***Cut fuel costs*** . . . by automatically maintaining desired combustion efficiency . . . no wasted Btu.

▪ Leeds and Northrup *System Engineering* is more than good design . . . it is the *correct* combination of industry-proved instruments and controls *correctly* applied to your rotary kiln process by teamwork between experienced L&N engineers and your production and engineering staff.

Using complete, coordinated design and construction facilities, L&N specialists combine standardized production techniques with the custom requirements of individual processes. Throughout the operation, a well-trained engineer with proper authority is assigned to direct your complete *system engineered* project, from drawing board to startup.

Planning new kilns? Beginning a plant modernization program? Write or call the Leeds and Northrup District Office near you or contact our Main Office, 4975 Stenton Ave., Philadelphia 44, Pa.

LEEDS **NORTHRUP**

instruments — *automatic controls* • *furnaces*

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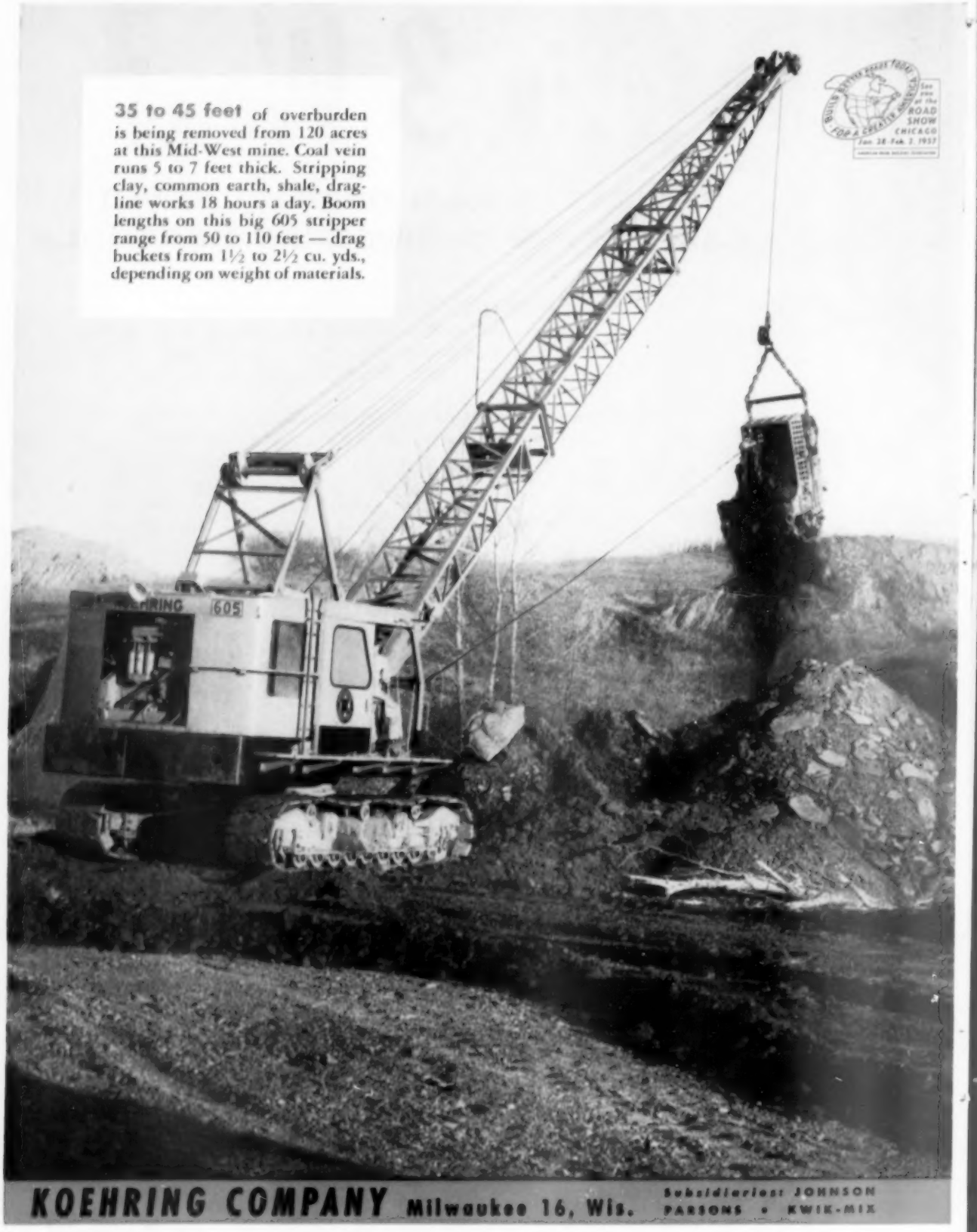
KOEHRING WORK CAPACITY *in action . . .*



35 to 45 feet of overburden is being removed from 120 acres at this Mid-West mine. Coal vein runs 5 to 7 feet thick. Stripping clay, common earth, shale, dragline works 18 hours a day. Boom lengths on this big 605 stripper range from 50 to 110 feet — drag buckets from 1½ to 2½ cu. yds., depending on weight of materials.

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

KOEHRING COMPANY Milwaukee 16, Wis. Subsidiaries: JOHNSON PARSONS • KWIK-MIX

Meet the 405 — new heavy-duty leader in the 1-yard class. Operators like its ease of control, big power clutch, automatic traction brakes, and simple 2-shaft design of upper machinery. *You'll* like its big work capacity with all attachments: 1-yard shovel or hoe, 1 to 1½-yard clam or dragline, 20-ton crane.

Pan-handler — In an Eastern quarry, slabs of sandstone are palletized on pans for quick pick-up, and loaded on trucks. Pans weigh an average of 3½ tons — an easy lift for the Koehring 205 truck crane. Constantly moving to various piles around the quarry, it easily loads 24 pans an hour, according to quarry foreman. With this mobile 205 crane they are equipped to handle loads up to 15 tons.

At rail siding, 305 clamshell crane speeds transfer of material from gondola cars to trucks. Its fast swing and wide work radius pay off on any material-handling. This heavy-duty 305 is another in a modern, new series of Koehring extra-capacity excavators and cranes. Look them over. They're all listed in accompanying chart.

Here are some figures that will interest you:

KOEHRING MODEL	SIZE DIPPER	LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)	
205 CRAWLER	½-Yd.	20,000 lbs.	at 10-foot radius
205 ON RUBBER	½-Yd.	30,000 lbs. 13,700 lbs.	at 12-foot radius at 20-foot radius
305 CRAWLER	¾-Yd.	30,000 lbs.	at 12-foot radius
305 ON RUBBER	¾-Yd.	30,000 lbs. 15,800 lbs.	at 10-foot radius at 30-foot radius
405 CRAWLER	1-Yd.	40,000 lbs.	at 12-foot radius
605 CRAWLER	1½-Yds.	72,300 lbs.	at 12-foot radius
1205 CRAWLER	3-Yds.	190,000 lbs.	at 13-foot radius

Want more information? Call Koehring distributor today.

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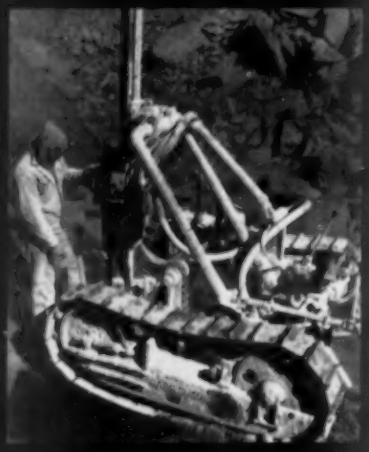
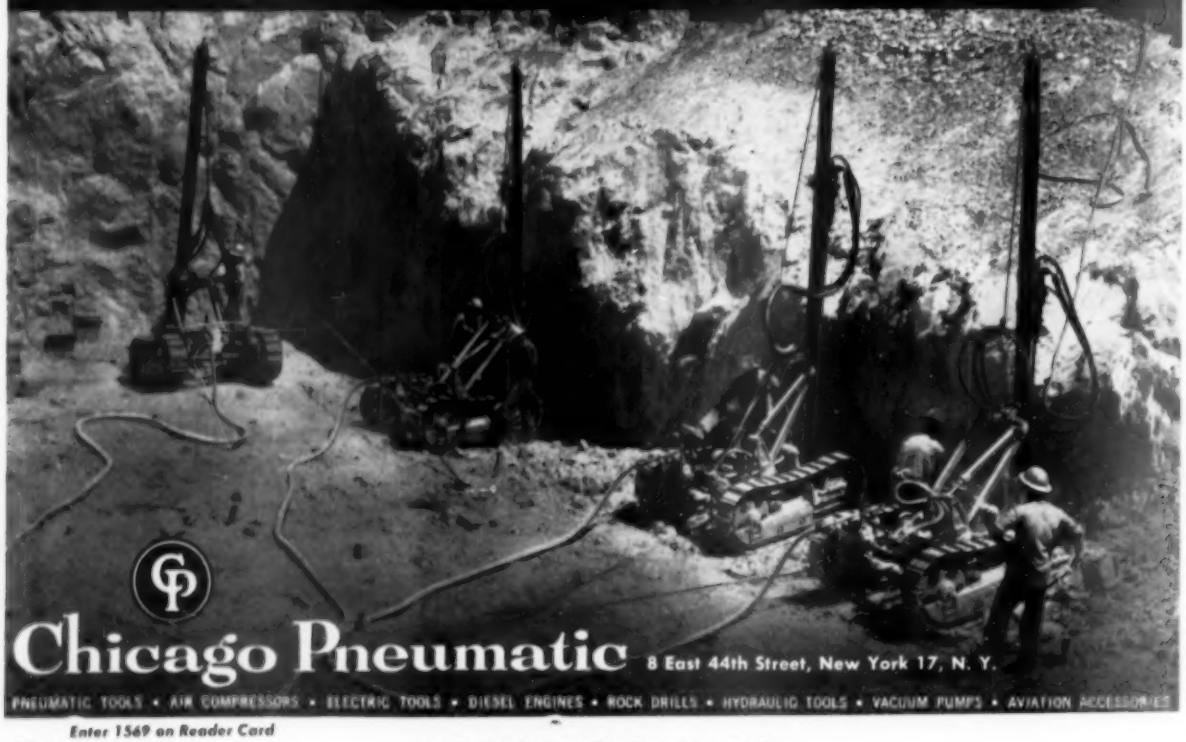
the G-800 TRACDRIL!

The self-propelled CP Tracdril pivots . . . moves forward or backward and can turn in its own length! "Tracdril" has a hydraulically actuated U-arm for fast drill carriage positioning. Can tow a 13,000 pound compressor up a 10% grade. Its "knee action" crawler tracks take rough terrain in stride. You save time moving from hole-to-hole, get more accurate spotting and gain productive drilling time.





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PEOPLE
IN THE NEWS

Bror Nordberg

Nordberg Joins Azbe Corp.

BROR NORDBERG, who until recently was editor of ROCK PRODUCTS, has been appointed vice-president of the Azbe Corp., St. Louis, Mo., well-known consulting engineering firm serving the lime and related industries throughout the world. Azbe Corp. was founded by Victor J. Azbe, president of the firm. Bror was editor of ROCK PRODUCTS for many years, having served faithfully and well as chief editor for 12 years and nine years as associate editor. Prior to his association with the publication, he was engaged in structural steel design and in other engineering capacities. He has traveled widely throughout the rock products industries and has written extensively based on first-hand study of plant operations.

Bror received his education in the public school system of Evanston, Ill., and was graduated from Northwestern University with B.S. and C.E. degrees. A professional engineer, he is a member of the Chicago Engineer's Club, American Institute of Mining and Metallurgical Engineers, American Society for Testing Materials, The Institute of Quarrying (Britain) and the American Concrete Institute. Currently he is serving on Committee C-7 on Lime, A.S.T.M., and is a past member and recent chairman of the Cement, Lime and Gypsum Committee as well as the Mineral Aggregates Committee of A.I.M.E.

ROCK PRODUCTS staff wish Bror the best of luck and success in his new venture.

Structural Engineer

DANIEL R. LUCCHESI has been appointed structural engineer in Maryland for the Portland Cement Association with headquarters in Philadelphia, Penn. He succeeds J. Robert Cassell, who has resigned to devote full time to his firm, Maryland Engineering and Surveying Co., Inc. A graduate of Loyola College, Baltimore, Md., Mr. Lucchesi received his engineering degree from Johns Hopkins University in Baltimore, and also studied communications at Yale University, New Haven, Conn.

Chairman of the Board

CHARLES PAYSON, New York, N.Y., has been named chairman of the board of New Lafayette Asbestos Co., Toronto, Canada. Other officers include: James Robb, New York, president and director; J. D. Liard, Toronto, vice-president and director; E. R. E. Carter, Toronto, secretary and director; George Scott, Toronto, treasurer; J. A. Hackett, Toronto, director; W. C. Campbell, Toronto, director; and Paul Gilbert, Charney, Quebec, director.

Executive Vice-President

JOHN K. ZIMMERMAN has been appointed executive vice-president of Pennsylvania Prestress, Inc., Carlisle, Penn., manufacturer of prestressed concrete products. For the past four years he has been a structural engineer with the Portland Cement Association. He received his education at Carlisle High School and the University of Notre Dame, and holds a degree in civil engineering from Purdue University, Lafayette, Ind. Mr. Zimmerman is a member of the American Concrete Institute, Professional Concrete Institute, Society of Professional Engineers, Engineers Society of Pennsylvania, American Society of Civil Engineers, and the Society of American Military Engineers.

Receive Service Awards

WILLIAM P. JACKSON, vice-president and general manager of Glacier Sand and Gravel Co., Seattle, Wash., and Stacy D. Raudenbush, works accountant at Kaiser Aluminum and Chemical Corp., Tacoma, Wash., were recently presented service awards upon completion of 25 years of service with the affiliated companies. Mr. Jackson joined the Kaiser organization in 1931, transferred to Permanente Cement Co. in 1945 and Glacier Sand and Gravel Co. in 1946. Mr. Raudenbush became associated with Kaiser in 1931 in construction work on the Hoover Dam. He was in the Kaiser shipyards in World War II and joined Kaiser Aluminum and Chemical Co. in 1946.

Kenneth A. Gutschick

Gutschick with N. L. A.

KENNETH A. GUTSCHICK, former associate editor of ROCK PRODUCTS, has joined the National Lime Association, Washington, D.C., as manager, technical service. A native of Chicago, Ken attended the University of Chicago on a scholarship where he obtained his B.S. and M.S. degrees in geography (physical sciences division) in 1949 and 1950. His master's thesis was a 150-page comprehensive geographic study of the nonmetallic mineral industries of the Chicago area. Following college, he taught geology and physiography for two years at the University of Notre Dame; served one year with Material Service Corp., Chicago, in production; and was field editor for Pit & Quarry magazine for nearly three years. In this latter capacity and in his recent position as associate editor for ROCK PRODUCTS, Ken has written articles on lime, cement, gypsum, crushed stone, sand and gravel, lightweight aggregates,

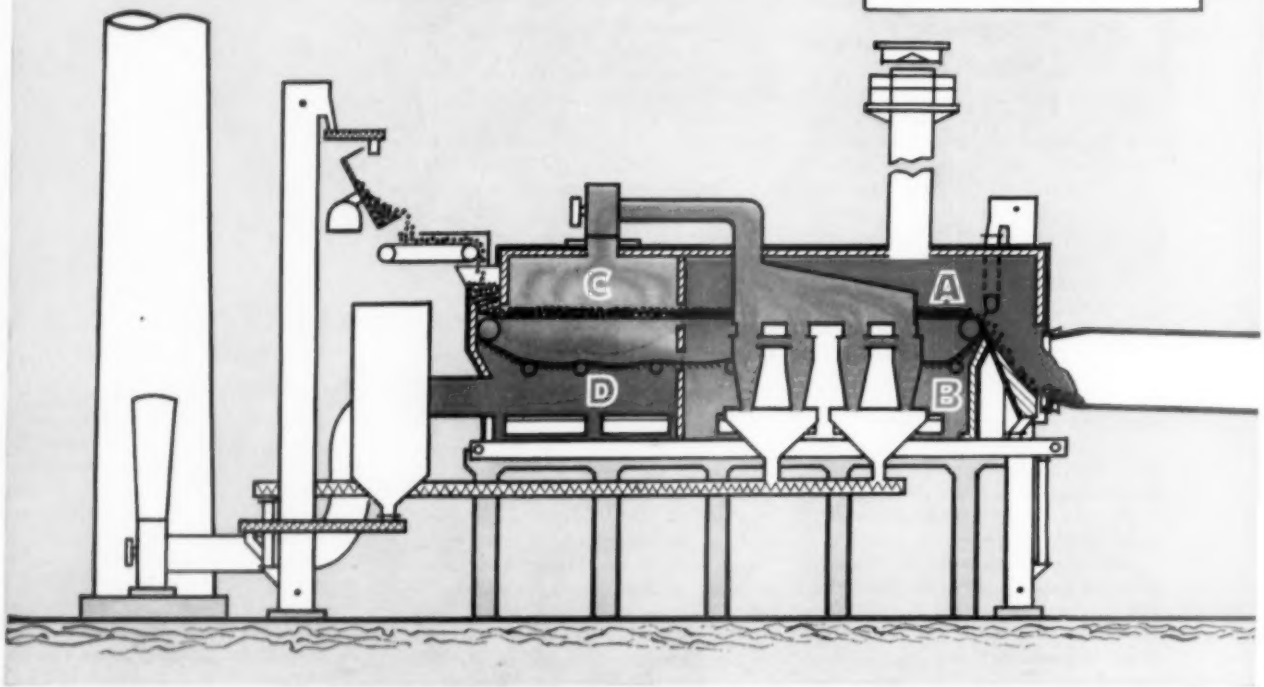
(Continued on page 32)

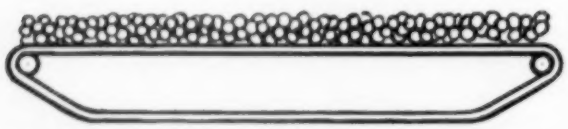
THE ACL SYSTEM Cuts Cost

...puts you in a better competitive position—HERE'S WHY!

LESS DUST LOSS

Double pass of gases through traveling bed of pellets reduces dust loss below 1% of feed weight without an additional dust-collecting system. Valuable processed material is saved. Dust load of exhaust gas is lower than in any other system.





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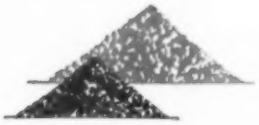
EFFECTIVE DUST FILTRATION . . . efficient heat transfer . . . more uniform, better burning clinker . . . substantial savings in fuel, power requirements, space and manpower . . . maintenance economy—all these im-

ALLIS-

of Producing Cement

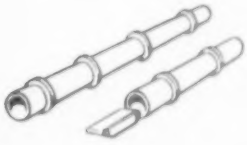


LESS FUEL

Fuel consumption for ACL systems now in operation averages 600,000 Btu per barrel of clinker. Conventional long, dry-process kilns range from 750,000 to 1,000,000 Btu. Powdered coal, fuel oil, natural or coke oven gas may be used.

LESS POWER

The ACL system for burning cement clinker requires about 2.3 kwhr per barrel of clinker for operation of kiln department. This is about one-third less power than required by rotary kilns using other preheating systems.



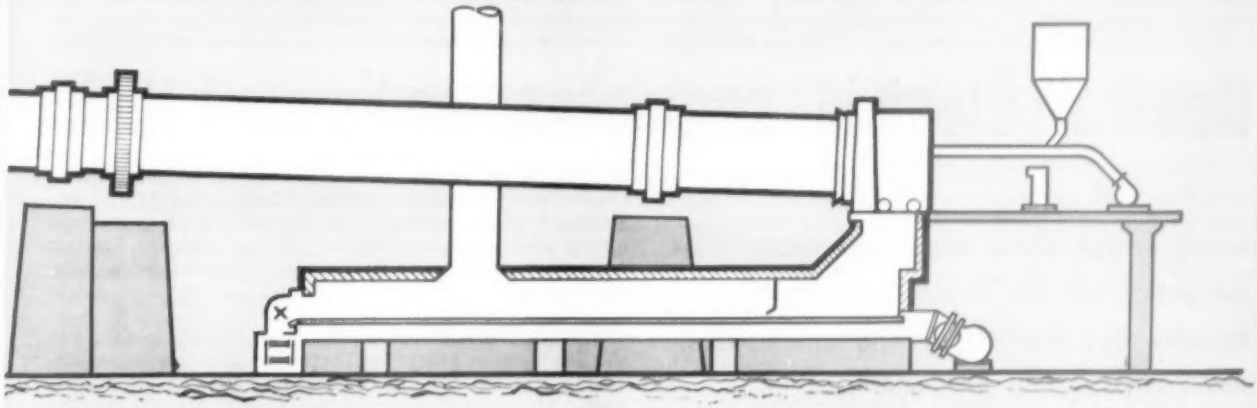
LESS SPACE

Entire ACL system—grate, kiln and cooler — is about 40% shorter than conventional long kiln installations. The totally enclosed traveling grate is about as high as the average kiln feed end housing.

How the Double-Pass System Works

Partial calcining and dust reclamation take place as hottest gases pass through the pellet bed on traveling grate. Gas temperatures are reduced from about 1800 to 500 degrees in this first pass (*A* to *B*). Next, gases pass through cyclones where larger dust particles are removed, and carried back to pelletizer. Final dust filtering takes place as gases pass through moist pellets on feed end of grate. In the second pass (*C* to *D*) gas temperatures are further reduced.

ACL is an Allis-Chalmers trademark.



portant advantages, and many more, are yours with the ACL system.

New Bulletin Available A new bulletin, describing the ACL system, Allis-Chalmers kilns and kiln auxiliaries, is ready for distribution. To get your copy, see your nearby Allis-Chalmers representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B8431.

58 Installations by Lellep Licensees since 1950

CHALMERS

A-5108

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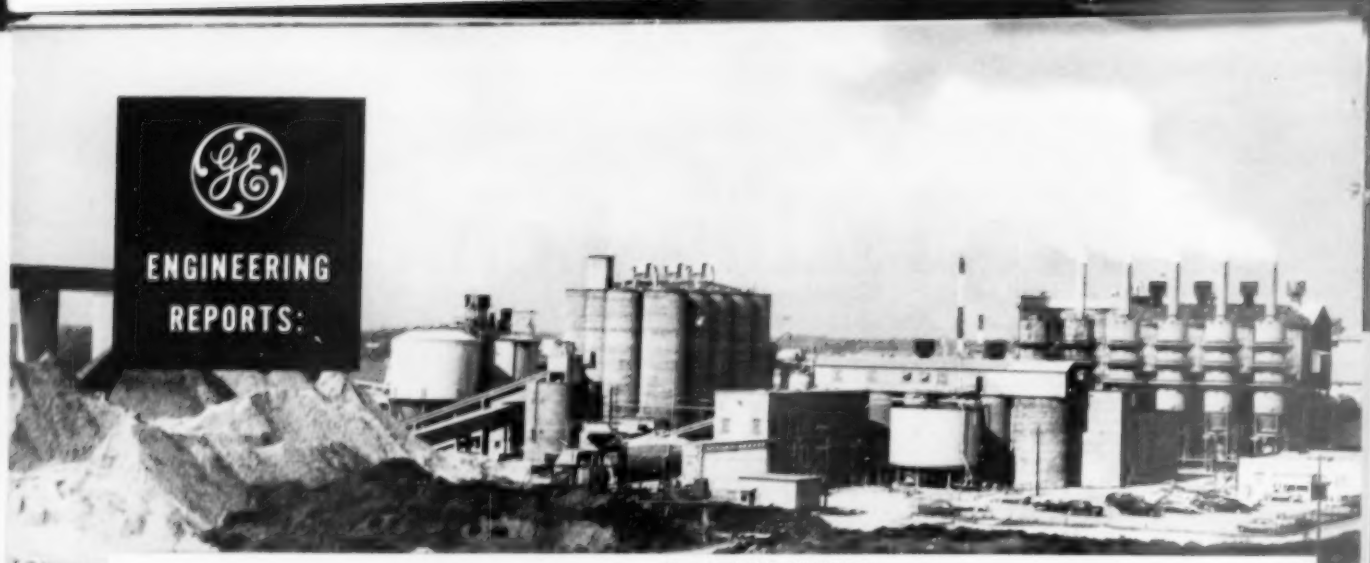
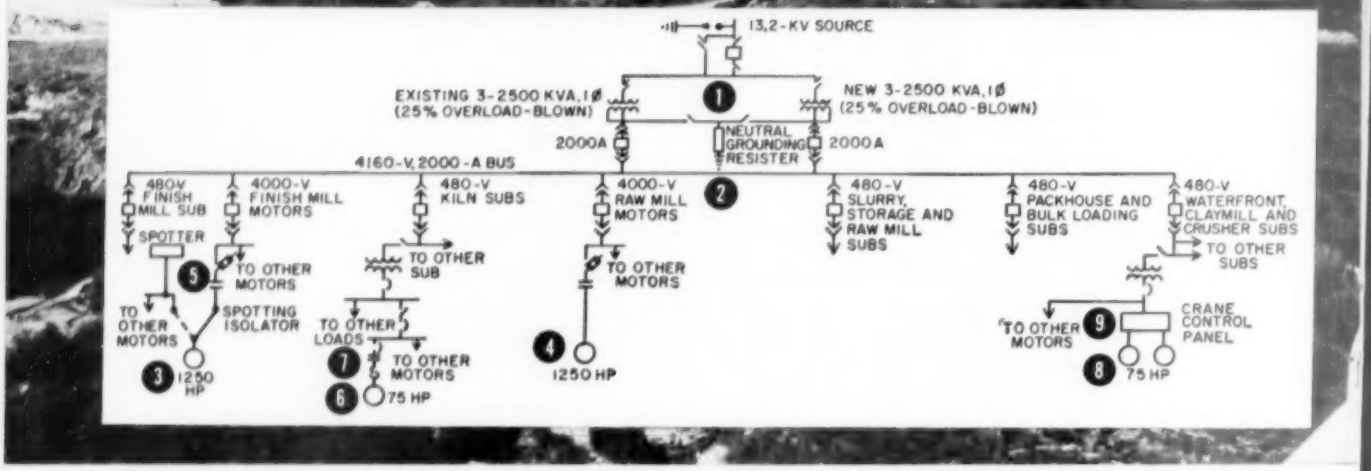
ENGINEERING REPORTS:





ONE-LINE DIAGRAM maps electrical expansion at plant. Numbers indicate typical new equipment supplied and are keyed to photographs. According to Ideal, project handling not only resulted in co-ordinated system but also cut administrative details.

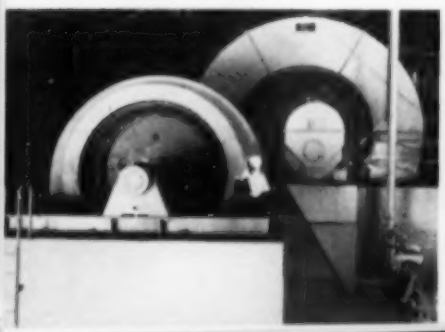
General Electric engineers, equipment help

Baton Rouge plant expansion exemplifies General Electric's "system approach" to providing highly reliable, economical power components

To better supply demands for cement in fast-growing southern and western states, Ideal Cement Co. announced plans in 1955 for companywide expansion aimed at raising capacity 50 percent. General Electric was selected to provide electrical systems for several of these new and expanding plants.

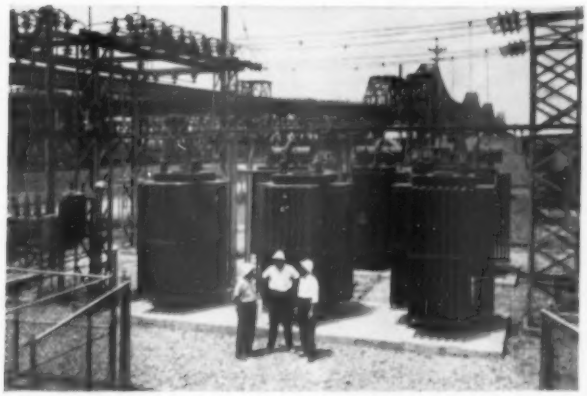
ONE SUCH PLANT, where General Electric was given project responsibility for supplying the electric equipment, was the Baton Rouge, Louisiana, wet-process plant. Here capacity was raised from 2,200,000 bbls. to 2,800,000 bbls. annually.

4 RAW-MILL DRIVE is another 1250-hp synchronous motor, emphasizing today's trend to larger milling units.



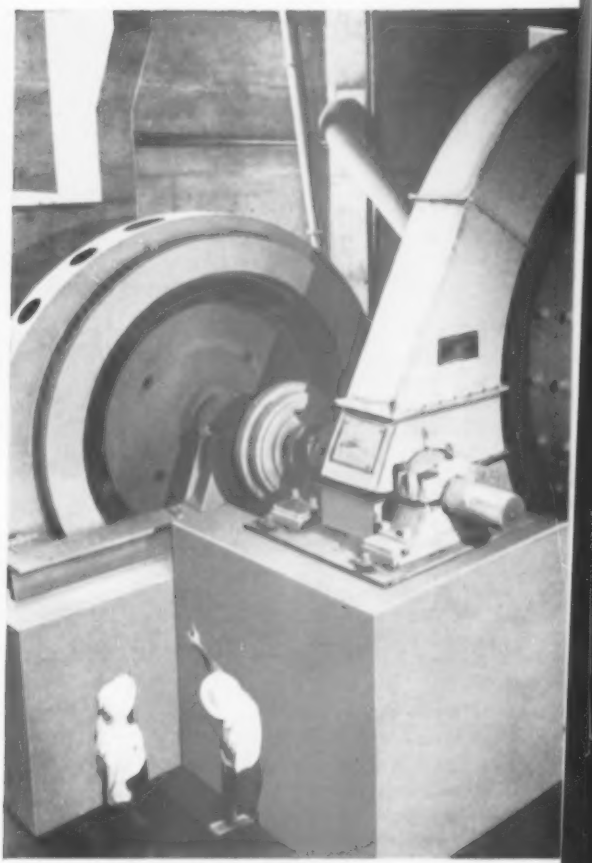
5 LIMITAMP® CONTROL (L) starts, protects 4000-v mill motors. Spotter allows slow rotation of mills for positioning of manholes.

6 KILN DRIVE uses simple, rugged adjustable-speed wound-rotor motor to provide reliability on this vital function.



1 MAIN SUBSTATION features neutral grounding system on 4.16-kv supply and new medium transformers which match existing bank. "Repetitive manufacture" units are shipped completely assembled, resulting in easier, less costly installation.

2 METAL-CLAD SWITCHGEAR protects main circuits, is located indoors for protection from atmosphere. In event of utility line's high-speed reclosing after faults, trip-out action of synchronous motor feeder minimizes possible damage to mills.



3 FINISH-MILL DRIVE is 1250-hp, 180-rpm, high-torque, synchronous motor specially designed for extra-heavy starting and cascading duty of ball-mill service. Unit allows spotting of mill manholes.

Ideal Cement expand to serve industry needs

G-E engineers, skilled in cement applications, and able to take a system approach to plant power needs, worked closely with customer engineers. They related power system characteristics to requirements of the ball mills in order to select motors and control exactly suiting specific needs. Tough auxiliary drive problems were handled in the same way.

As a result, the plant has a matched, well co-ordinated system wherein each component is integrated with the characteristics of the others. This helps assure Ideal top reliability and flexibility at most reasonable overall purchase, operating and service cost.

WHATEVER YOUR ELECTRICAL NEEDS, whether at cement or other rock product plants, General Electric engineering and equipment can work for you. Contact your nearest G-E Apparatus Sales Representative, General Electric Co., Schenectady 5, N. Y. 658-17

*Reg. Trade Mark of General Electric Co.

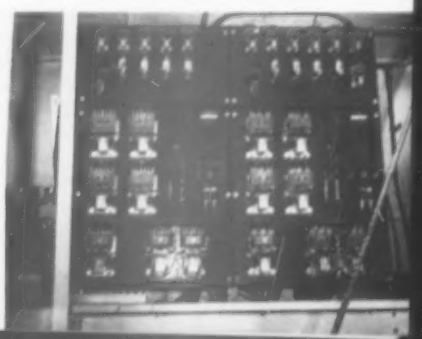
Engineered Electrical Systems for Rock Products Industry

GENERAL ELECTRIC

7 KILN-DRIVE CONTROL as well as other low-voltage motor control is provided by convenient, factory-wired control centers.

8 CRANE DRIVE of Tri-Clad* wound-rotor motors at waterfront crane has given Ideal highly reliable service for several years.

9 CRANE CONTROL, since conversion to co-ordinated G-E system, has aided in increased production.



concrete products, and other nonmetallic minerals.

In his new position, he will devote his activities to research, promotion and publicity on burned lime products in all fields, as well as serving as general assistant to Robert S. Boynton, general manager of N. L. A.

ROCK PRODUCTS staff wish Ken the best of luck and success in his new position.

Receive A.S.T.M. Awards

HARRISON F. GONNERMAN, consulting engineer and research consultant on cement and concrete, Oak Park, Ill., and former assistant to the vice-president for research and development, Portland Cement Association, and John W. McBurney, retired consultant on masonry and masonry materials, National Bureau of Standards, Washington, D.C., received Awards of Merit from the American Society for Testing Materials at its recent meeting in Atlantic City, N.J.

Heads Prestressed Concrete Association

J. ASHTON GRAY, president, Duracrete, Inc., Leesburg, Fla., recently was elected president of the Prestressed Concrete Institute. He succeeds George W. Ford, vice-president, R. H. Wright and Son, Ft. Lauderdale, Fla. Douglas Cone, Florida Prestressed Concrete, Tampa, Fla., was elected secretary-treasurer, and Ben Gerwick, Jr., Los Angeles, Calif., was made vice-president.

General Sales Manager

STANLEY B. ROBERTS has been named general sales manager of the Heavy Minerals Co., Chicago, Ill., which is a subsidiary of Crane Co., Vitro Corp. of America, and Pechiney, French chemical group, and engaged principally in the mining, processing and sale of thorium, rutile, ilmenite, zircon, kyanite and monazite.

Heads Pipe Association

WILLIAM T. BROWNSON, Lamar Pipe and Tile Co., Lansing, Mich., was recently elected president of the Concrete Pipe Association of Michigan. Philip Valle, Kalamazoo Block and Pipe Co., was named vice-president; William Davis, American Vitrified Products Corp., secretary; and C. F. Meanwell, Superior Products Co., treasurer. H. M. Hultquist continues as managing director-engineer of the Association.

G. Edward Elsenhans

Technical Service Engineer

G. EDWARD ELSENHANS has been appointed technical service engineer of the Dragon Cement Co., New York, N. Y. He was formerly technical director of Metropolitan Sand and Gravel Co., Port Washington, Long Island, and previously served as technical service manager of Universal Atlas Cement Co. Mr. Elsenhans was graduated from the Thayer School of Civil Engineering, Dartmouth College, Hanover, N. H., with a degree in civil engineering.

Manages Basic Division

ROBERT O. BEMIS has been appointed manager of the agricultural sales division of Basic, Inc., Cleveland, Ohio. A graduate of Adelbert College of Western Reserve University and formerly assistant to the manager of the division, Mr. Bemis replaces James Eells, who has retired and is living in Princeton, N. J.

Executive Assistant

WILLIAM FLEEGER, JR., has been appointed executive assistant to Fred L. Doolittle, executive vice-president of Penn-Dixie Cement Corp., New York, N.Y. Formerly chief clerk in the general sales department, he has been associated with the company since 1945.

Director of Advertising

FRANK J. O'NEILL has been appointed director of advertising and sales promotion for the International Minerals and Chemical Corp., Chicago, Ill. A graduate of Northwestern University, Mr. O'Neill was formerly director of advertising and sales promotion for Sidney Wanzer & Sons. Henry E. Wessel has been named manager of product development. He is a graduate of the Illinois Institute of Technology and formerly served as manager of the engineering economics division of the Midwest Research Institute. Emanuel Heimberg has been promoted to manager of market analysis. Formerly with Glyco as assistant to the sales manager in technical chemicals sales service, he has an A.B. degree in chemistry from Harvard University, Cambridge, Mass., and an M.B.A. degree in marketing from Columbia University, New York, N. Y.

Sales Manager

RICHARD W. HALLER has been appointed sales manager for the Merle Hay Concrete Products Co., Des Moines, Iowa, according to an announcement by Robert Astley, president. Formerly a sales representative for the Graybar Electric Co., he attended the University of Louisville and Drake University, Des Moines, Iowa.

Assistant General Manager

W. R. ADAY has been named assistant general manager of Wamix, Inc., Dallas, Texas, where he will supervise maintenance and repair of all equipment in addition to his duties as manager of the plant. He has been associated with the firm since its incorporation in 1948, serving as contract hauler and truck superintendent before becoming plant manager.

Texcrete Sales Manager

E. C. PETROSKEY has been appointed sales manager for Texcrete Structural Products Co., Dallas, Texas, an affiliate of Texas Industries, Inc. Mr. Petroskey, who has been in the precast concrete field for 35 years, joined the company in 1954 as a sales specialist. Prior to that he was Washington, D. C., representative for the Federal Cement Tile Co., Chicago, Ill.

C. of C. Committee Chairman

FRANK E. MCCASLIN, president, Oregon Portland Cement Co., Portland, Ore., has been reappointed chairman of the Natural Resources Committee, Chamber of Commerce of the United States, for the year 1956-57. He has been head of the committee for the past three years. E. Phil Gemmer, president, Texas Construction Material Co., Houston, Texas, is a member of the Committee on Minerals and Metals Industries.

(Continued on page 35)

Enter 1570 on Reader Card

New bucket elevator components by CHAIN Belt match today's heavier cement mill demands

Best chains ever designed for elevator service!

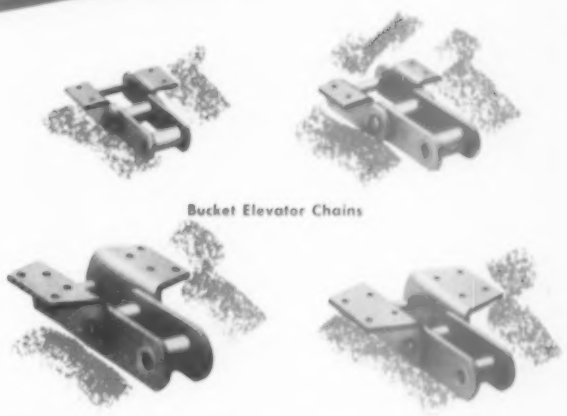
To meet the demands of greater capacity and longer operating hours of modern cement mill bucket elevators, CHAIN Belt Research developed new and improved chains of greater strength and durability, especially for cement mill service.

BALANCED DESIGN . . . All chain parts balanced for utmost strength, lightest weight. Less dead weight, less bulk . . . take less horsepower to move than other chains for this service.

MAXIMUM WEAR-LIFE . . . High quality steels, proper heat-treatment, controlled press fits, plus fine workmanship assure maximum wear-life.

ACCURATE PITCH . . . Close tolerances and controlled fits maintain accurate pitch for long, top performance. Wide links and generous attachment length provide extra support for modern, big-capacity buckets.

Used on any installation, you can expect more for your chain dollar — more service, capacity, efficient operation when you choose new Rex Elevator Chains!



Bucket Elevator Chains

Segmental rim sprockets, traction wheels cut down time

The tough, long-lasting hardened cast steel rims on these sprockets and traction wheels simply bolt on. When replacement is necessary, only the rim is replaced. Down time is cut to hours, not days. Sprocket rims are machined on two sides — may be reversed to give double life. Hubs are available in split or solid design.

Segmental Rim Sprockets

Segmental Rim Traction Wheels

New bucket design gives large capacity, long service

Designed especially for the new stronger chains, these buckets have many new design features. The style AC, for instance, features a hooded back that gives efficient discharge on continuously spaced installations. It also has a high front that increases its capacity for handling free-flowing materials. Another feature is the special air vents in the bottom that prevent trapping during loading and unloading of fluffy materials.

These buckets will give longer service under rough cement mill treatment. Tough Rex High-Grade Malleable Iron is used. Extra thick bucket walls are provided for greater strength, longer wear. Buckets are designed to give you more efficient, increased-capacity handling of all materials.

Rex Style AC Bucket

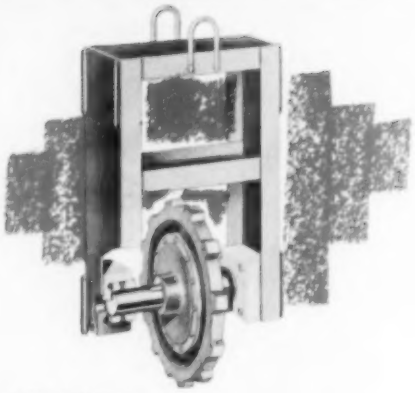
Rex Style AA Bucket

TURN THIS PAGE FOR MORE INFORMATION

CHAIN BELT COMPANY

LEADERSHIP . . . through creative engineering

CHAIN Belt gives you a full line of products for economical cement mill service



Internal gravity take-up

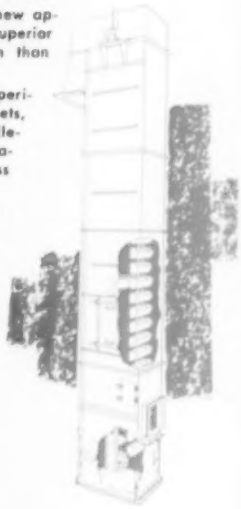
Another Rex development, this gravity take-up automatically compensates for chain and sprocket wear and temperature variations . . . lengthens life of chains, sprockets and bearings. The welded steel frame floats freely in an upright guide inside the elevator casing. Internal mounting insures a dust-tight boot section. Bearings are heavy-duty, heat-treated tool steel sleeves for long, trouble-free service.

For modern cement mill service —
REX RATED Centrifugal Discharge Bucket Elevators

The ultimate in bucket elevator design! A completely new approach to elevator design makes the REX RATED Elevator superior for economical, dependable, greater capacity operation than ever before.

Rex Engineers combined modern elevator design and field experience with new components — bearings, chains, buckets, sprockets, take-ups — to bring you the first "Balanced Design" Bucket Elevator. These elevators are matched to modern cement mill operations — they have greater capacity, will work longer with less maintenance, give you more service at lower costs.

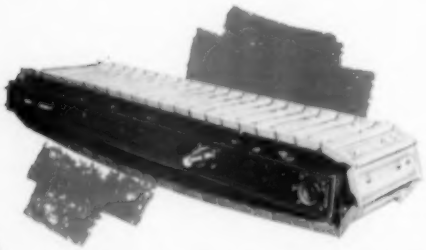
REX RATED Centrifugal Elevators take little space — save valuable floor area. They are economical to construct. And because they are balance designed, they make down time and production lags a thing of the past.

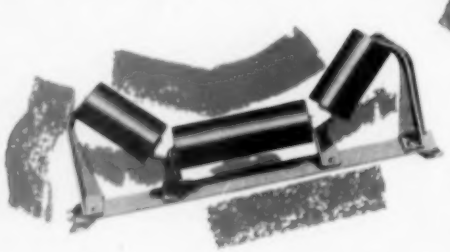


Shafer Self-Aligning Roller Bearings

The unique Shafer Bearing combines the best of roller and ball design. The result is a tough, high load-carrying bearing that provides a high degree of self-alignment. To this feature is added a built-in Micro-Lock that provides easy adjustment for simple installation and maintenance.

Another feature of these bearings is a special "Z" Housing Seal that keeps lubricant in and dirt out. All the features of the Shafer Bearing combine to give more economy, longer service, more efficient operation on any cement mill job.





Look to CHAIN Belt, too, for feeders, belt idlers

CHAIN Belt offers a complete line of other bucket elevators, components and bulk materials handling equipment. Here, for example, are Rex Apron Feeders and Rex Belt Idlers.

For perfect production control, Rex Apron Feeders give you a uniform, metered feed rate. No underfeeding; no overfeeding. You can count on regulated flow at all times. And these feeders are made to handle a wide capacity range at top efficiency . . . take hot or cold material.

Rex Idlers like the bucket elevators are REX RATED to match the job. They are famous for their long, dependable operation and easy servicing features. Rex Idlers are quality made with labyrinth seals . . . roller bearings . . . unit inner-tube mounting — all to assure low power consumption, long life and smooth rolling.

CHAIN Belt Company
4649 W. Greenfield Ave., Dept. RP-2
Milwaukee 1, Wisconsin

- ☐ Send informative catalog on REX RATED Centrifugal Discharge Bucket Elevators.
- ☐ Send informative literature on Rex Bucket Elevator Components.
- ☐ Please have a CHAIN Belt District Sales Engineer call.

Name .....

Address .....

Company .....

City ..... Zone ..... State .....

CHAIN BELT COMPANY
MILWAUKEE 1, WISCONSIN

Alpha Appointments

J. J. BETHUNE has been named general traffic manager of the Alpha Portland Cement Co., Easton, Penn., in addition to his duties as assistant sales manager. He joined the firm in 1928 at Birmingham, Ala., serving as office and traffic manager until transferring to Easton in 1955 as assistant sales manager. Stanley Hawk has been appointed eastern division traffic manager succeeding W. N. Knecht, who has retired after 46 years of service. R. B. Horrom has been made western division traffic manager, and A. V. Mays has been appointed southern division traffic manager.

Niagara Sales Manager

IRA QUINBY has been appointed sales manager of Niagara Concrete Pipe Ltd., St. Catherines, Ontario, Canada. Previously Mr. Quinby served as assistant city engineer for the City of Tonawanda, N. Y.; structural field engineer, Portland Cement Association; sales engineer, Dual Mix Concrete and Materials Ltd., Toronto; and sales manager, Mount Royal Paving and Supply Ltd., Montreal. J. Douglas Sproat, formerly with the Ontario Construction Co. Ltd., and A. Bruce Patterson, formerly with Scarfe & Co., have joined the sales staff.

Kelley Island Sales Manager

JAY M. COLIN, formerly sales representative, has been promoted to divisional sales manager of the Kelley Island Co., Cleveland, Ohio. He will cover the area from Buffalo, N.Y., to the Indiana state line, including Pittsburgh, Erie, Cleveland and Toledo. He joined the original Kelley Island Lime and Transport Co. in 1939 as superintendent of the stone and sand dock at Fairport. In 1946 he was transferred to the Cleveland office where he subsequently became sales representative for the Pennsylvania, Ohio and West Virginia area.

Plant Manager

R. L. LOGAN has been appointed manager of the Niagara Falls electrochemical plant of the potash division of International Minerals and Chemical Corp., Chicago, Ill. Formerly assistant manager of the plant, he succeeds Charles H. Berle.

Vice-President of Operations

WILLIAM B. PHILLIPS has been named vice-president of operations and administration of The Master Builders Co., division of American-Marietta Co., Cleveland, Ohio. He has been with the firm since 1946, serving as assistant comptroller, assistant to the general sales manager, assistant to the executive vice president and assistant to the president. James E. Gingerich is general plant manager and Carl E. Gysan is manager of the purchasing and traffic department.

P.C.A. Regional Manager

HUGH BARNES has been appointed regional manager in charge of the new Los Angeles regional office of the Portland Cement Association, Chicago, Ill., to supervise activities of the Los Angeles and Seattle, Wash., district offices. Mr. Barnes joined the P.C.A. in 1937 and has been Los Angeles district engineer since 1942. He is a graduate civil engineer from Kansas State College, Manhattan, Kan.

John M. McNerney has been named to succeed Mr. Barnes as Los Angeles district engineer in charge of the Los Angeles district office. A graduate in geology from the University of Missouri, Columbia, Mo., he has been with the Association since 1941, most recently as a statewide paving engineer for the Los Angeles office.

Daniel Webster has been appointed district engineer in charge of the Portland, Me., office, serving Maine, Vermont and New Hampshire. A graduate of the University of Maine, Mr. Webster joined the Association in 1954 as a field engineer.

Albert L. Blackwell, a field engineer for the New York office since 1946, has been made district engineer of the Trenton, N. J., office. He is a civil engineering graduate of Newark College of Engineering.

William J. Moore, also a field engineer in the New York office, has been appointed district engineer of the Baltimore office to serve Maryland and Delaware. He is a graduate of Purdue University, Lafayette, Ind., in civil engineering.

J. J. Farra, a field engineer in the Indianapolis office since 1947, has been named district engineer in charge of the Louisville, Ky., office. He is a civil engineering graduate of the University of Kentucky, Lexington, Ky.

Heads Gravel Firm

VICTOR BRUNNER has been elected president of the Gravel Products Corp., Buffalo, N. Y. Formerly vice-president, he succeeds Ernest M. Hammond, who died July 28. Leonard Garvey, formerly assistant general manager, has been made vice-president and general manager. Mr. Brunner is also president of the LeRoy Lime and Crushed Stone Co., LeRoy, N. Y., and the Erie Paving Co.

OBITUARIES

HERBERT C. MOATZ, president and chairman of the board of the Collinwood Shale Brick & Supply Co., Cleveland, Ohio, died July 25 at the age of 77. Born in Jersey City, he moved to Cleveland in 1896 to enter Adelbert College of Western Reserve University, where he was graduated in 1900. Nine years later he joined the Deckman-Duty Brick Co. Subsequently he and a group of associates took over the Collinwood plant of the company and changed the name to Collinwood Shale Brick & Supply Co.

GUSTAVE E. KAHN, well known civil engineer of Milwaukee, Wis., and a pioneer in the use of reinforced concrete in the United States, died August 7 after a short illness. He was 75 years of age. A civil engineering graduate of the University of Wisconsin, Madison, Wis., Mr. Kahn studied the use of reinforced concrete in France and used it in construction projects here.

A. SIDNEY BUCKLE, retired manager of the Canada Cement Co., Ltd., Montreal, Canada, died August 17 at the age of 66. Well known in the transportation field, he was a member of the Canadian Industrial Traffic League and past-chairman of the Quebec division. He was also a member of the Montreal Traffic Club.

W. C. KINZEL, JR., production manager, Knoxville Sangravl Material Co., Knoxville, Tenn., died suddenly while riding in the car of R. E. Gettys, president of the firm. Mr. Kinzel was 49 years old and had been production manager since 1936.

WALTER A. RUPP, owner and operator of the Rupp Construction Co., sand and gravel firm of Marshallville, Ohio, died suddenly on August 1. He was 57 years old and had been in the sand and gravel business since 1938.

ROSCOE A. WILSON, owner and operator of Wilson Concrete Products, Centerville, Ohio, died August 8 following a three-month illness. He was 46 years of age.

ORVAL R. PETERS, owner of the Peters Sand & Gravel Co., Blue Mound, Ill., died September 4 following a short illness. He was 55 years old.

JOHN M. SWICKARD, a partner in the Swickard & Crissman Concrete Block Co., Columbus, Ohio, died August 11. He was 60 years of age.

INSPECTION WITHOUT REJECTION. Under this close scrutiny, USS Lorain Rolled Plate Lining passes every test—shows it is ready to take the toughest kind of punishment.

SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS LORAIN ROLLED PLATE LININGS *and* USS GRINDING BALLS

USS

6-2280

UNITED STATES

SHOWN DURING CONSTRUCTION are seven of the eight new ball mills that will bring Lone Star's annual capacity at Nazareth, Pa. to 3,600,000 bbls.

For its enlarged plant . . .

Lone Star Cement

again chooses

USS Lorain Rolled Plate Lining

Lone Star Cement Corporation is one of the world's largest Portland cement producers. Now, at Nazareth, Pennsylvania, enlarged facilities are rapidly nearing completion which will bring their plant up to an annual capacity of 3,600,000 bbls.

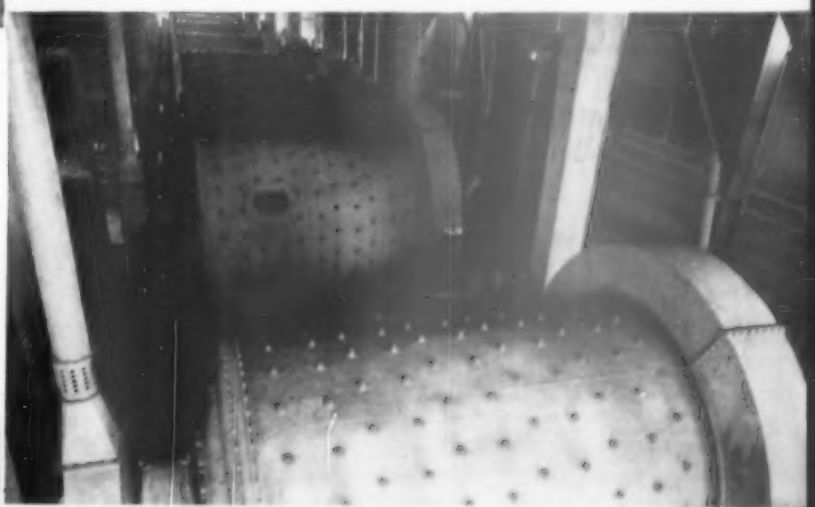
For this huge new addition, Lone Star chose USS Lorain Rolled Plate Linings for their new grinding units. This selection was based on past performance in Lone Star's other plants. It's a tribute to the wearing qualities and design of these extra-tough linings.

This extra toughness stems from the use of high-carbon rolled steel in the liner plates and alloy rolled steel in the lift bars. Each lining is custom made to fit the exact requirements of a particular mill.

The heat-treated lift bars have a marked hardness differential from the liner plates; this retains lift for the life of the lining. The result is constant grinding efficiency, maintenance of output and, above all, reduced grinding costs.

The lining design selected by Lone Star for their new Nazareth mills was the USS Lorain "staggered" type of lining, which will greatly reduce impact and vibration in any grinding mill.

Like Lone Star, specify USS Lorain Rolled Steel Plate Lining if you are interested in the above improvements. You'll "stay" with it, too. For expert engineering assistance on any grinding problem, just write to Specialty Products Sales, United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.



S T E E L

Photo courtesy Iowa Manufacturing Co.

Marfak makes the difference

CHASSIS LUBRICATION with *Texaco Marfak* can mean the difference between "just-average" and "really efficient" equipment performance. This world-famous lubricant *seals itself in* the bearings and *stays there* no matter how tough the service. It shuts out dirt and moisture, gives top protection against wear and rust, assures high equipment efficiency at rock-bottom maintenance costs.

For the best in wheel bearing lubrication, use *Texaco Marfak Heavy Duty*. Like regular *Marfak*, it stays in the bearings, sealing out mud and dirt for thousands of extra miles. Results—longer bearing life, safer braking. No seasonal change is required.

If you want *just one* lubricant for *all* chassis, wheel bearing, water pump and other grease lubrication—try new multi-purpose, lithium-base *Texaco Marfak Heavy Duty Special 2*. It pumps easily, lubricates effectively regardless of the thermometer—resists water washing and stands up in the severest service.

MORE THAN 625 MILLION POUNDS OF TEXACO MARFAK HAVE BEEN SOLD

In crawler mechanisms, *Texaco Track Roll Lubricant* assures more dependable performance by keeping out dirt and moisture, fighting off wear and rust.

Let a Texaco Lubrication Engineer help you choose the proper lubricants. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, New York.

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TEXACO Lubricants and Fuels
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INDUSTRY NEWS

Cover Picture

THIS MONTH'S COVER ILLUSTRATION is an aerial view of the Inland Cement Co., Ltd., plant recently placed in operation at Edmonton, Alta., Canada. Located in one of the most rapidly expanding industrial areas of Canada in the heart of the gas and oil-producing section, it is anticipated the cement production will have an increasingly expanding market. It is a wet process operation with a 11- x 340-ft. Allis-Chalmers rotary kiln. Gas is used to fire the kiln. The plant, financed with Belgian and Canadian capital, is controlled through Sogemines Limited, Montreal, Que., which was organized to finance industrial and mining projects in Canada.

Gypsum Expansion Slated

NATIONAL GYPSUM CO., Buffalo, N. Y., revealed that it is mapping plans for a $19,000,000 Great Lakes area expansion program. Melvin H. Baker, chairman of the board, said that development will begin soon of the company's northern Michigan gypsum deposits, and that two new Great Lakes area gypsum processing plants will be set up. Sites for the latter are to be announced.

Sales and earnings of National Gypsum for the first half of 1956 were the highest for any 6-month period in the company's history. Sales jumped 13 percent to $81,394,696, and earnings rose 15 percent to $8,934,684.

Limestone in Production

AMES LIMESTONE CO., a subsidiary of Hanna Coal Co., Adena, Ohio, has begun production at its new quarry near Carrollton, Ohio. Crushed aggregates for commercial purposes and agricultural limestone are produced, at the rate of 300-400 t.p.h.

The installation includes a double impeller, impact type crusher. Six storage bins hold 90 tons each. The stripping operation will utilize three power shovels, two units of 2½-cu. yd. capacity and one, of 7-cu. yd. capacity. Taisto Laine, superintendent of the plant, is also treasurer of the National Crushed Limestone Institute, Washington, D. C.

Process Florida Sands

HEAVY MINERALS CO., Chattanooga, Tenn., will establish a plant near Panama City, Fla., to extract heavy minerals from the beach sands. It will employ about 80 people.

Another new plant in the area will be built at Milton, Fla., by N.R.C. Metals Corp., Cambridge, Mass. Employing 150 people when it goes into production next year, the plant will process zircon from sand to produce zirconium metal for the Atomic Energy Commission. It will also produce hafnium, used by the A.E.C. for control rod material in nuclear reactors.

British Aglite Plant

THE BUTTERLEY CO. is initiating production in England of aglite, an expanded shale building material developed in the United States by Frank Leftwich. A plant in Derbyshire is the first to have begun production of the aggregate, at the rate of 1000 cu. yd. per day. The company plans to locate other plants throughout England until national distribution is reached.

Plant Nears Completion

UNIVERSAL ATLAS CEMENT CO., New York, N. Y., is nearing completion of its Milwaukee, Wis., plant in the Menomonee Valley. Installation of machinery and equipment is expected before the end of the year.

Seventeen storage silos have been erected, as has the mill building which will contain two finishing mills, conveyors, and temporary storage facilities. Raw materials will come directly to the plant site by freighter.

Starts Sixth Kiln

PERMANENTE CEMENT CO., Oakland, Calif., has put into production a sixth kiln at its Los Altos, Calif. cement plant. This will increase Permanente's production capacity by 1,500,000 bbl. per year; raising the plant's annual capacity to 8,500,000 bbl.

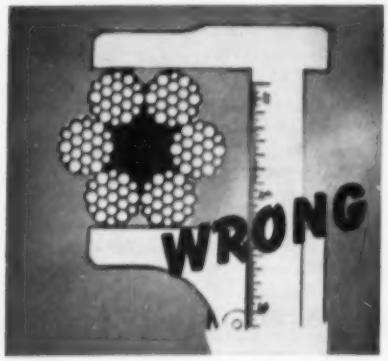
The 12- x 450-ft. kiln is among the largest now used in the cement industry. Two 1000-hp. grinding mills and additional belt conveyors have been installed as complementary equipment. The plant's electrostatic dust collection system has also been expanded. Clinker storage capacity has been increased

(Continued on page 45)

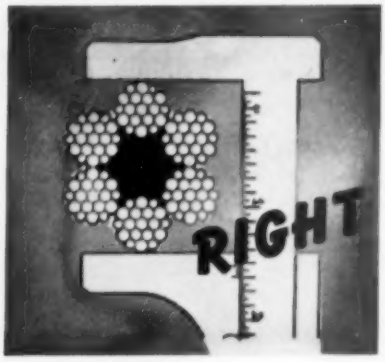
Permanente Cement Co.'s new sixth kiln (at left) has been put into operation

Tuffy® Tips

If Present Rope Is Correct Size, Measure with a Caliper



Measuring the Wrong Diameter is a common mistake that some buyers make when they order replacement rope. When the rope arrives, it turns out to be too small—even though a machinist's caliper was used to assure accuracy. It's an easy mistake to make, but it's just as easy to remember the *right* way and be sure you get the right size rope. Otherwise both the safety factor and service life of the rope will be reduced.

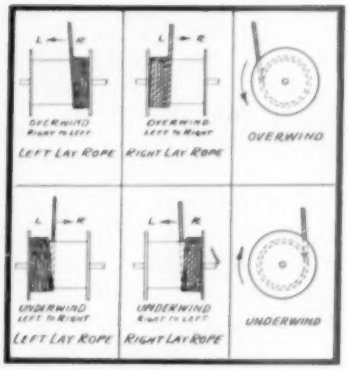


Measuring the Right Diameter is the simple step shown above. Measure so that a single strand is on each of the adjustable edges of the caliper—*not* two strands that measure as a flat side. The actual diameter of a wire rope is the same as that of the circle required to circumscribe it. The diameter of a wire rope is an important factor in determining the safe working load to be handled by your equipment.

How To Measure Groove Diameter

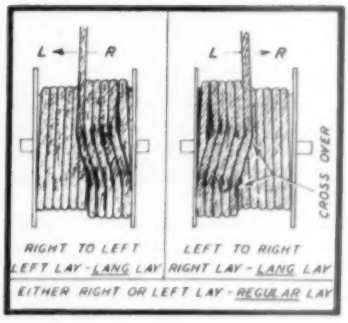
Shown above is the WRONG way to measure the groove diameter. The result—shorter life of the wire rope you buy. Note that only the sides of the rope will bear on the sheave. In a relatively short time this will squeeze the rope out of round and set up destructive friction and stresses on the rope strands and wires. New rope is oversize and diameter of grooves on sheaves and drums should be slightly larger.

Shown above is the *CORRECT* way to measure the groove diameter. It is a simple thing to do and will give the rope you buy a chance to deliver all the service it possibly can. Remember a wire rope is composed of many closely correlated working parts and sheave grooves which are too large or too small throw them out of alignment. Just like any other working part on a machine, wire rope cannot do its best if it is misfitted.



Rope Lay for One Layer Winding

These diagrams show when it is best to use right lay or left lay rope on one-layer winding. The direction of winding is determined by standing behind the drum, looking toward the direction of the rope travel.



Rope for Two Or More Layer Winding

When a rope winds on the first layer across the face of a drum, it usually travels in a uniform pattern. But when it reaches the flange of the drum, the rope rides on the last strand of the first layer for one turn. Then, it slips into the grooves between each course of rope on the first layer. To move across the drum in this manner, the rope actually winds *back* a turn in each revolution. Then it must jump across *two* grooves in the first layer. This always occurs on the even-numbered layers, and often causes crushing. This abuse is minimized by use of properly designed grooves, spacers and lifters.

In Shoes Or In WIRE ROPE Misfitting Is Hard On The Pocketbook

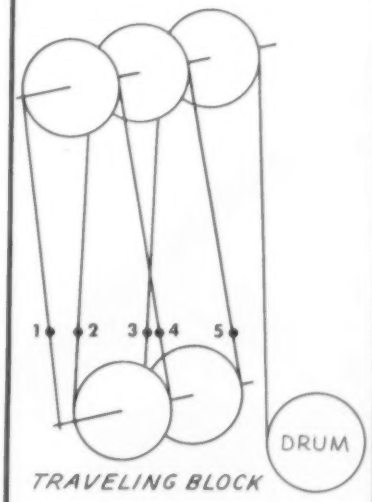
Replace Worn Sheaves

Check for sheaves that have been badly worn. Sheaves that have grooves corrugated by the rope lay impression should be replaced immediately before installing new rope. Since rope creeps to a certain extent on sheaves these grooves can actually cut the strands as the rope runs over. This will greatly reduce service life of *any* wire rope.

Breaking In New Rope

After a wire rope is installed, it is advisable always to run the new wire rope with a light load or with no load for a short period of time. This "breaking in" process gives the component parts of the rope an opportunity to adjust themselves to the conditions under which the rope is to operate. The time spent "breaking in" a wire rope will pay dividends in extra useful rope life.

How To Count The Number of Parts Supporting the Load



Draw an imaginary line across the parts of the rope supporting the load.

The wire rope on many machines is not used in a single or direct pull. It is often reeved through sheaves, which gives a mechanical power advantage.

Send For Free Chart Which Allows Easy Figuring of Actual Stress On Rope For Any Given Piece of Machinery Reeving From One to Eight Parts.

Don't Say "Wire Rope" – say Tuffy

Tuffy Slings & Hoist Line

Machine braided slings that consistently keep costs down, keep safety records clear. A tough, flexible hoist line. A balanced team.

Tuffy Scraper Rope

Special construction assures resistance to drum crushing and the strains caused by angle pulls through swivel-mounted sheaves, rapid line and shock of load on slack line.

Tuffy Dragline

Outer wires offer large area to resist abrasion . . . inner structure made for flexibility. The result is a rope that casts freely, fights off shocks and line pulls.

Tuffy Dozer Rope

Get extra dozer rope service — mount a 150' reel of Tuffy on your dozer, feed through only enough to replace damaged section on the drum. ½" and 9/16".

Your Tuffy Distributor Works to Learn Your Business

When new equipment comes out, he has already checked into it . . . finding out why it does the job better, how it works. Why? Because he's interested in earning your continued patronage. And part of that service is helping you out with fast answers *when* you need them—especially right answers to your wire rope problems. Give him a call.

union Wire Rope corp.

2156 Manchester Avenue Kansas City 26, Missouri

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

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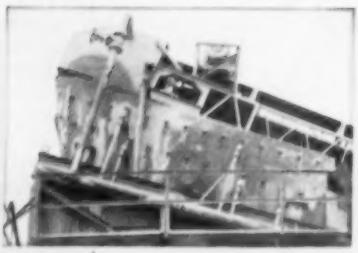
PROFIT THROUGH ...WITH SIMPLICITY

A 4' x 12' and a 4' x 10' Triple Deck Model D Gyrating Screen, set in tandem, performs a final washing and sizing operation. The washed gravel is fed to five storage bins, so that any specification can be met by blending on the conveyor belt underneath these bins.



This Simplicity 5' x 14' Two Deck Model D Gyrating Screen takes its feed from the raw material stock pile via conveyor. All decks have washing sprays. The three products produced of sand and gravel are fed by conveyors to individual stock piles.

Aggregate is carried right from the pit to this Simplicity 3' x 8' Model BG Heavy Duty Scalping Screen. Fines are screened through to the conveyor below, while oversize is scalped to crusher.

ACCURATE SIZING GYRATING SCREENS

4,500 tons of aggregate a day is classified by four Simplicity screens at Holly Sand and Gravel, near Holly, Michigan

Working two shifts of 9 hours each, the Holly Sand and Gravel Company is daily processing 4,500 tons of aggregate, and the firm's General Manager expects to exceed this total in the near future. All this material is sized on four Simplicity screens. Simplicity Model D Gyrating Screens and a Model BG Scalping Screen efficiently and accurately classify the aggregate into grades 10A, 6A, Pea Rock, Torpedo Sand, and Mason Sand. This fast and accurate sizing is typical of the performance of Simplicity Screens throughout the aggregate industry. In addition, a 3' x 6' Model C Single Deck Screen has recently been installed to produce 100% clean Pea Pebbles, by eliminating the buckshot. The Simplicity Gyrating Screen is the original type of mechanically vibrated screen using the counterbalanced eccentric shaft. The counterbalance is machined directly on the shaft, thus giving positive action with perfect smoothness.

Simplicity Gyrating Scalpers are heavy-duty machines built on the same basic principles as the Gyrating Screens, but with a grizzly deck to scalp off the oversize rock. These units are designed to withstand terrific impact. They perform two jobs at once by feeding the oversize into a crusher, and screening the fines.

Wherever you need fast, efficient scalping, screening, or feeding in your aggregate operation, Simplicity equipment can be a big help to you . . . write us today for complete information.

Simplicity
TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND 13, MICHIGAN

SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario
FOR EXPORT: Brown and Sites, 50 Church St., New York 7, N. Y.

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ERIE PORTABLE TRUCK MIXER PLANT SPEEDS COMPLETION OF NEW AIR BASE

Tandy & Allen's manually operated ERIE truck mixer plant is a P3-50A Combination Bin; equipped with AB3R 2 cu. yd. Aggregate Batcher having beamscales; EAC 17-75, 75 T. P. H. Capacity Aggregate Elevator; 8' x 8' Truck Hopper and Ladder; 10 H.P. Motor; and Swivel Distributor

"MAKE IT QUICK, but make it good. This job is needed not only for civilian airplanes, but for Uncle Sam's jet fighters and bombers."

Those terse, urgent instructions were given to Tandy & Allen Construction Co., Inc., Hackensack, N. J. prime contractors for the new Burlington Vermont Municipal Airport.

Tandy & Allen went right to work. First item needed to "make it quick, but good" was a portable truck mixer plant that could be put up in a hurry —and which would provide efficient production of specification concrete.

Like hundreds of other contractors, Tandy & Allen found an ERIE Portable Truck Mixer Plant was their best buy. Here's what President Allen D. Allen says about the ERIE plant his firm purchased from Hodge & Hammond, Inc., New York, N. Y.:

"We had the ERIE up and ready to go in just three days. It really kept our trucks on the go with the 15,000 cubic yards of quality concrete needed for runways, ready aprons and hangers. We averaged 200 cu. yds. daily on the project. We're glad to recommend the ERIE to any contractor who needs an efficient, highly portable quick erecting truck mixer plant for fast production of specification concrete."

For literature, write Dept. No. P106

ERIE STRAYER COMPANY

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by 200,000 bbl., and the bulk loading tanks have been expanded by 15,000 bbl. This is the third major expansion of the plant since it first began operations in January, 1940.

The new 2,500,000-bbl. Permanente plant near Lucerne Valley, Calif., is scheduled to begin operations late this fall.

Seeks U.S. Capital

A SOUTH AMERICAN MINING COMPANY is seeking U. S. capital for expansion of its asbestos production. Phillips Asbestos Mines (Pty.), Ltd., wishes to arrange for loan capital which might also carry the right to conversion to equity participation on maturity. Equity investment, with management participation, also is sought for development of crysotile properties in Southern Rhodesia and Rhodesian chrome and lepidolite deposits.

Data on the proposal are available for review on loan from the Investment Development Division, Bureau of Foreign Commerce, Washington 25, D. C. A World Trade Directory report on John Beith Pty., Ltd., also is available to qualified U. S. companies from B.F.C.'s Commercial Intelligence Division for $1.

Huron Selects Site

HURON PORTLAND CEMENT CO., Detroit, Mich., has purchased Sportsmen's Dock at Benton Harbor, Mich., as the site of a storage and handling plant. The site, on the St. Joseph River, is located near the Chesapeake and Ohio Railroad right of way.

Fill for the plant site is to be gained from a dredging operation in the adjoining turning basin, for which the U. S. Army awarded an $85,680 contract to Lyons Construction Co. It is estimated that 108,000 cu. yd. of fill dirt will be dredged while deepening the basin. The silt will be pumped through a 2222-ft., 12-in. pipeline mounted on pontoons from the dredge site to the dock at a rate of 3000 cu. yd. per day.

Rogers Quarry Sold

T. P. ROGERS STONE CO., INC., Stroudsburg, Penn., operated in Bossardsville, Penn., for the last 21 years, has been taken over by Herbert R. Imbt. The company has been renamed Hamilton Stone Co. A number of improvements are being made at the quarry, as well as at the nearby plant which produces bituminous concrete. A new concrete batching plant is being erected.

Calaveras Cement Co.'s new bulk cement transfer plant at San Leandro, Calif.

Bulk Cement Transfer Plant

CALAVERAS CEMENT CO., San Francisco, Calif., has opened a bulk cement transfer plant in San Leandro, Calif., to provide the San Francisco and East Bay areas with a nearby supply of bulk cement. The plant has a storage capacity of 5000 bbl. which is replenished daily by rail.

A feature of the plant is a 60-ft. Fairbanks Morse automatic platform scale. Two bulk truck and trailer combinations can be loaded simultaneously every 7 minutes. Merle Segale of Calaveras designed the plant and supervised construction. Two steel silos, 20-ft. dia. and 36-ft. high, were fabricated by C. S. Johnson Co. in Stockton, Calif., and erected on the site by D. W. Nicholson Corp. of San Leandro.

Rock Wool Plant Opens

AMERICAN ROCK WOOL CORP., Wabash, Ind., has opened its Corsicana, Texas, plant. The plant will service United States Gypsum Co.'s outlets in Texas, Oklahoma, and parts of Missouri, Arkansas, Kansas, Colorado and New Mexico.

Enough insulation will be produced at the plant for about 50,000 homes a year, plant officials said. Slag used at Corsicana will be shipped in from Daingerfield and El Paso.

Medusa Adds Kiln

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, is adding a third 10- x 175-ft. rotary kiln, to its York, Penn., plant, along with nine storage silos, 26-ft. dia. x 140-ft. The third kiln will be put into operation shortly, and the silos are expected to be ready for use by the end of the year.

Medusa has also purchased limestone deposits near Wampum, Penn. from the Carbon Limestone Co. The $200,000 purchase is said to represent a 30-year supply for the new plant nearby.

New Cement Carrier

PONCE PRODUCTS, INC., has put into service a new type of cement carrier with a compressed air system of unloading. The ship was converted from a war era Liberty collier at a total cost of $2.5 million, and is sailing under the name Florida State.

According to Jose A. Ferre, president of Ponce Products, the vessel has a 9000-ton capacity; unloading equipment will discharge her cargo in about 16 hours. The Ferre fleet plys between Ponce, Puerto Rico, and Port Everglades, Fla. The company's cement plants in Puerto Rico are presently turning out about 3500 t.p.d.

The Florida State utilizes Airslides to carry the cement to the hoppers in the holds, where compressed air forces the cement to shore installations through 10-in. pipe.

Increase Mill Capacity

KOSMOS PORTLAND CEMENT CO., INC., Louisville, Ky., has increased the capacity of its mill at Kosmosdale, Ky., to a little more than 2,000,000 bbl. of portland cement annually. It also produces Kosmortar, a masonry cement. The company is anticipating additional enlargement of its facilities within a 2-year period, putting in a new mill on the same property.

Present plans call for one kiln at the start, with provisions to add others, up to an ultimate capacity of 4,000,000 bbl. of portland cement a year, according to Charles Horner, president.

Trico Stone Modernizes

TRICO STONE, INC., Burkesville, Ky., has installed a new crusher at its Tompkinsville, Ky., quarry, and has completed the overhaul of its plant headquarters in a modernization program. The plant has a 110-t.p.h. capacity.

Successor to Monroe-Cumberland Crushed Stone Co., Trico Stone is owned by H. L. Coombs, Harlin Comer, Bill Stephens, R. E. Gaddie, Jack Millard and Dalton Ford. Mr. Ford is president and general manager.

N.S.G.A. Safety Contest

NATIONAL SAND AND GRAVEL ASSOCIATION, Washington, D. C., is conducting its second annual safety contest. The contest will cover the period from July 1, 1955 to June 30, 1956. Awards will be made on a plant basis, and companies wishing to enroll more than one plant should make individual entries for each one.

(Continued on page 49)

BULL'S-EYE LOADING EASY EVERY TIME. Shovel operator has big 10 x 14-foot target to shoot at. High tensile steel body sides, triple-section bottom with oak plank filler stand up to rock-shock and abrasion. The "65" Payhauler frame is strongest known of any off-highway truck in its class.

UP 15% GRADES IN SECOND GEAR! Smooth, easy shifting results in minimum loss of momentum on grades or turns, even with a full load. Turbo-charged, 250 hp diesel engine keeps power high, reduces fuel consumption 10% or more. Maximum engine torque is transmitted efficiently through new Cerametallic clutch and planetary final drive into greater pay-off power!

36.5 MPH IN HIGH! Proper power and gear ratio results in higher speeds than most other off-highway trucks. Choice of 5 or 10-speed transmissions provides excellent speed range for all conditions. Steering is power-assisted for easy control on haul roads, quick spotting under shovels.

new International® "65"

...highball 22-ton loads

DUMPS IN LESS THAN 8 SECONDS! Three-stage, double-action hydraulic hoist provides full power control up or down. Built-in hydraulic snubber valves assure smooth, over-center dumping action and return the body gently to the frame. Proper weight distribution permits safe dumping at edge of fill, yet adequate weight is retained on drive wheels for traction on steep grades.

Payhaulers Pay Off! From Wisconsin—Missouri—Kentucky—from all over the map—rock men are reporting sensational performance from new off-highway International Payhaulers. The capacity-boosting Payhauler features that quarry men themselves asked for—from top hp per struck yard, to the amazing new efficiency-adding ease of control—are paying off in bonus production.

Payhaulers® *whip 15% grades*

—for Kentucky stone co.

Hot from Anchorage, Kentucky, comes Jefferson County stone company's report. Here, new "65" International Payhaulers speed limestone from 40-foot quarry face to crusher, 1,200 feet away. The "65's" big, wide body makes loading easy for the fast-swinging International-powered Bucyrus-Erie shovel.

Ample, turbo-charged diesel power, plus load-matched gear ratios, smooths the get-away and quickly shifts the Payhauler's *58 gross tons* into time-gaining, hill-climbing higher gears! Each Payhauler delivers extra bonus tons of rock per hour to the crusher!

Payhauler operator, J. L. Sutherland, sums up "65" performance this way: "The Payhauler rides good, has excellent visibility and maneuverability. Shifts easy. Engine power matches hauler size, to pull a 20-22 ton load from the quarry in 2nd gear, over haul-road grades up to 15%."

New International Payhaulers come in 18-ton Model "65," and 24-ton Model "95." Have your International Construction Equipment Distributor prove Payhauler *profitability* to you!

See you at
the ROAD SHOW—CHICAGO
Jan. 27 to Feb. 4, 1957

INTERNATIONAL HARVESTER

INTERNATIONAL® Construction Equipment

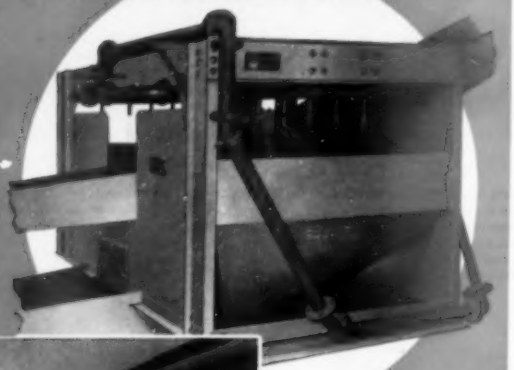
International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

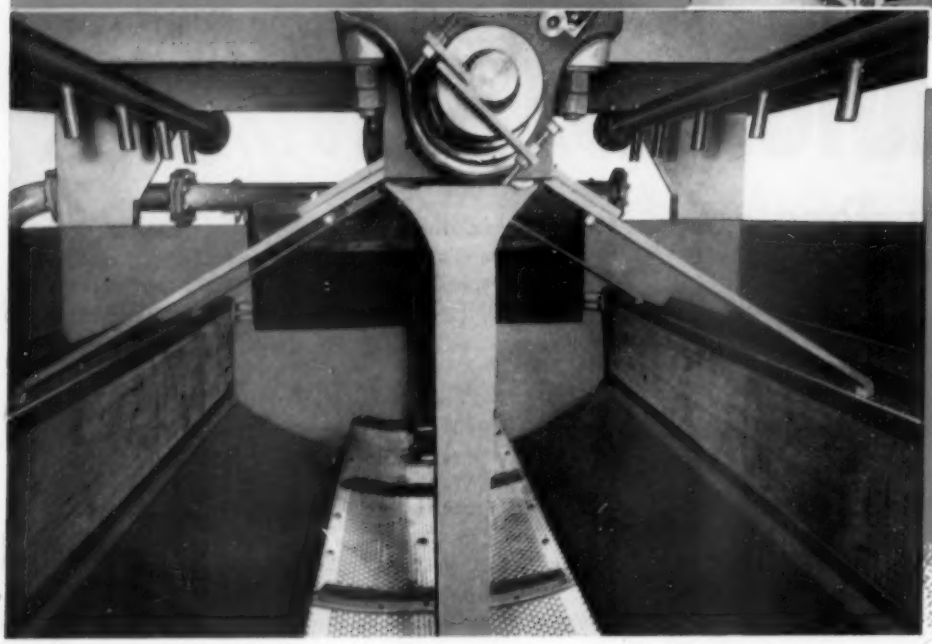
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

Now...BETTER HM SEPARATION

with OCC Vessel

because of its large productive pool area





Left, view of the interior of the OCC Heavy Media Vessel, illustrating its large pool area; view is from discharge end of vessel. Above, exterior view: float and sink discharges on left and feed chute on right.

U. S. and Foreign Patents Pending

Simplicity of OCC Vessel Introduces Broad Operating Economies

Since the introduction of the Heavy Media process, the development of a separator whose simplicity would match that of the process has been an aim. This has been achieved through the design of the OCC Vessel illustrated above. The rake suspended in the center oscillates the width of the vessel. In so doing, it maintains in productive use practically the entire volume of the vessel, in contrast to other separators employing only a fraction of same. The result is improved metallurgy and increased economy.

The remarkable simplicity of the vessel is pointed up by the fact that the rake, the only moving part in the vessel, performs not only the function of removing the sink but also that of keeping the medium in suspension. Let us send you details of how the OCC vessel can increase your operating profits, and reduce maintenance costs in an HMS plant.

Send for information on pilot plant demonstration & testing services.

THE ORE & CHEMICAL CORPORATION

Division: Mining & Milling Machinery • 80 BROAD ST., NEW YORK 4, N. Y.

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Dragon To Merge With American-Marietta

AMERICAN-MARIETTA CO., Chicago, Ill., and Dragon Cement Co., New York, N. Y., have announced that Marietta will acquire the assets of Dragon. The deal calls for an exchange of 1 1/20 common shares of American-Marietta for each share of Dragon common. In the $30 million acquisition, Marietta will use 510,000 shares.

Dragon is successor to Lawrence Portland Cement Co., and operated plants in Northampton, Penn., and Thomaston, Me., with a combined annual capacity of 4,500,000 bbl. James H. Ackerman, president, will continue in that office and will become a Marietta director.

American - Marietta, with cement plants in Alabama and West Virginia, produces about 5,100,000 bbl. annually. The company's capacity, following the merger and completion of a proposed expansion program for Marietta, will go over the 10,000,000 bbl. per year mark. It is also a major producer of concrete pipe.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 29,606,000 bbl. of finished cement during May, 1956, as reported by the Bureau of Mines. This was an increase of 10 percent over May, 1955. Mill shipments totaled 31,787,000 bbl., an increase of 9 percent, compared with May, 1955, while stocks on hand were 26,198,000 bbl., 11 percent more than on the same date a year ago. Clinker production during May, 1956, amounted to 27,853,000 bbl., an increase of 8 percent from the May, 1955, figure. The output of finished cement came from 158 plants in 37 states and Puerto Rico. During the same period of 1955, 27,031,000 bbl. of finished cement were produced.

Pavement Yardage

AWARDS of concrete pavement for the month of August, 1956, and total awards for the first 8 months of 1956 were listed by the Portland Cement Association as follows:

	Sq. Yd. awarded during:	
	August, 1956	First 8 Mos.
Roads	3,218,840	29,005,643
Streets and alleys	3,693,366	23,601,917
Airports	1,485,960	7,851,678
Totals	8,398,166	60,459,238

Egyptian Imports

EGYPT'S MINISTRY OF COMMERCE, Cairo, announces that the country will stop importing cement after the end of this year.

Coming Conventions

October 11-12, 1956—
New York State Concrete Masonry Association, Annual Meeting, Hotel Roosevelt, New York, N. Y.

October 17-19, 1956—
National Industrial Sand Association, Fall Meeting, The Greenbrier, White Sulphur Springs, W. Va.

October 22-26, 1956—
National Safety Congress and Exposition, Conrad Hilton, Congress, Morrison and LaSalle Hotels, Chicago, Ill.

October 24-25, 1956—
American Concrete Institute, 9th Annual Regional Meeting, Sheraton-Mount Royal Hotel, Montreal, Canada.

November 12-19, 1956—
American Concrete Pressure Pipe Association, 8th Annual Convention, Castle Harbour Hotel, Tucker's Town, Bermuda.

November 14-16, 1956—
Southeastern Concrete Masonry Association, Annual Meeting, Eden Roc Hotel, Miami Beach, Fla.

January 15-17, 1957—
National Crushed Stone Association, 40th Annual Convention, American Hotel, Miami Beach, Fla.

January 16-17, 1957—
Wisconsin Concrete Products Association, 36th Annual Convention, Plankinton Hotel, Milwaukee, Wis.

January 22-23, 1957—
National Agricultural Limestone Institute, 12th Annual Convention, Statler Hotel, Washington, D. C.

January 23, 1957—
National Crushed Limestone Institute, Annual Convention, Statler Hotel, Washington, D. C.

January 28-February 2, 1957—
American Road Builders' Association, Convention and Road Show, National Amphitheater, Chicago, Ill.

January 31-February 2, 1957—
National Bituminous Concrete Association, 2nd Annual Convention, Conrad Hilton Hotel, Chicago, Ill.

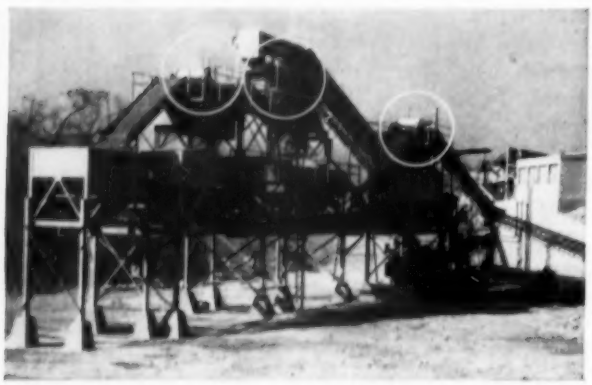
February 11-14, 1957—
National Sand and Gravel Association, 41st Annual Convention, Statler Hotel, Los Angeles, Calif.

February 11-14, 1957—
National Ready Mixed Concrete Association, 27th Annual Convention, Statler Hotel, Los Angeles, Calif.

February 25-28, 1957—
National Concrete Masonry Association, Annual Meeting and Exposition, Hotel Jefferson, St. Louis, Mo. Exhibit at Kiel Auditorium.

YOU GET MOST ACCURATE
on new Highway Program Jobs with

Above are shown 11 Cedarapids Horizontal Vibrating Screens on the screening plant of Concrete Materials Plant at Moline, Kansas. Concrete Materials has 16 of these screens in this one plant to maintain a 1000 TPH production rate.



Three Cedarapids 4' x 12' Horizontal Vibrating Screens handle 240 ton per hour output from a Double Impeller Impact Breaker, and produce six sizes of aggregate. The plant is owned by New Hope Crushed Gravel Co., New Hope, Pennsylvania.

67 Cedarapids Screens used on Kansas Turnpike

When aggregate contractors on the Kansas Turnpike were required to produce big tonnages of rigidly specified aggregates from poor material, they turned to Cedarapids Horizontal Vibrating Screens. A total of 67 of these screens were used in portable and stationary equipment to scalp fines, classify material and grade finished products. These screens assure owners of accuracy and maximum capacity since screen cloth openings are all in a horizontal position and at a right angle to the fall of material so that all material that should go through the screen goes through.

The Cedarapids Line of Equipment Includes:

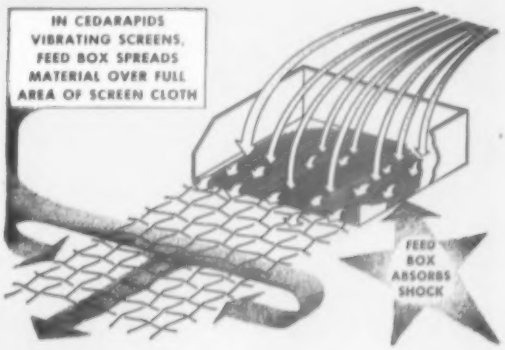
PORTABLE AND STATIONARY CRUSHING, SCREENING AND WASHING PLANTS FOR STONE, GRAVEL AND SAND • BELT CONVEYORS • VIBRATOR AND REVOLVING SCREENS • FEEDERS • HAMMERMILLS • DOUBLE IMPELLER IMPACT BREAKERS • BATCH TYPE AND CONTINUOUS TYPE BITUMINOUS MIXING PLANTS • DRIERS • DUST COLLECTORS • VIBRATING SOIL COMPACTION UNITS • MOTORIZED HEAD PULLEYS

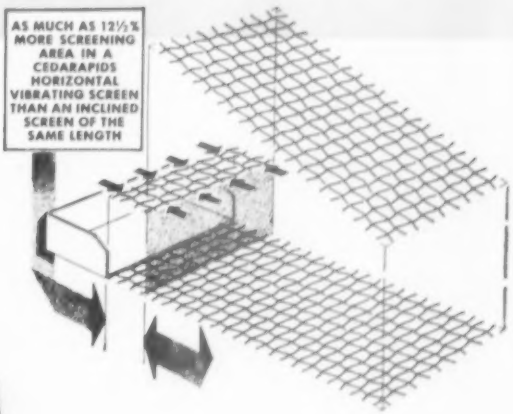
Built by Iowa . . . Sold the World Over

GRADATION FOR HIGH TYPE SPECS

Cedarapids Horizontal Vibrating Screens

● Big volume production of aggregate that meets the high type specs of Turnpike and National Highway jobs requires the best in screening equipment. You can be sure of having the best when you depend on Cedarapids Horizontal Vibrating Screens. They are designed to give you 20% to 30% more efficient gradation since the horizontal position of the screen and almost vertical fall of material increases screening capacity because the full area of the screen cloth openings is available for material to pass through. Another advantage is that the horizontal position gives 12% more effective screening area than ordinary inclined screens of the same length. Flexibility of screen deck arrangements gives you accurate control of a variety of products. Your Cedarapids dealer can explain the many ways that these high production screens can be used in stationary or portable aggregate plants.




AS MUCH AS 12½% MORE SCREENING AREA IN A CEDARAPIDS HORIZONTAL VIBRATING SCREEN THAN AN INCLINED SCREEN OF THE SAME LENGTH

A big volume of oversize material comes off one Cedarapids Horizontal Vibrating Screen onto a second for further classification on Bero Construction Company's Washing and Screening Plant at Plattsburg, N. Y. This Cedarapids plant consists of a 60" x 10' Scrubber, two 48" x 12' Double Deck Screens, four 23 cu. yd. bin units and conveyors, all Cedarapids.

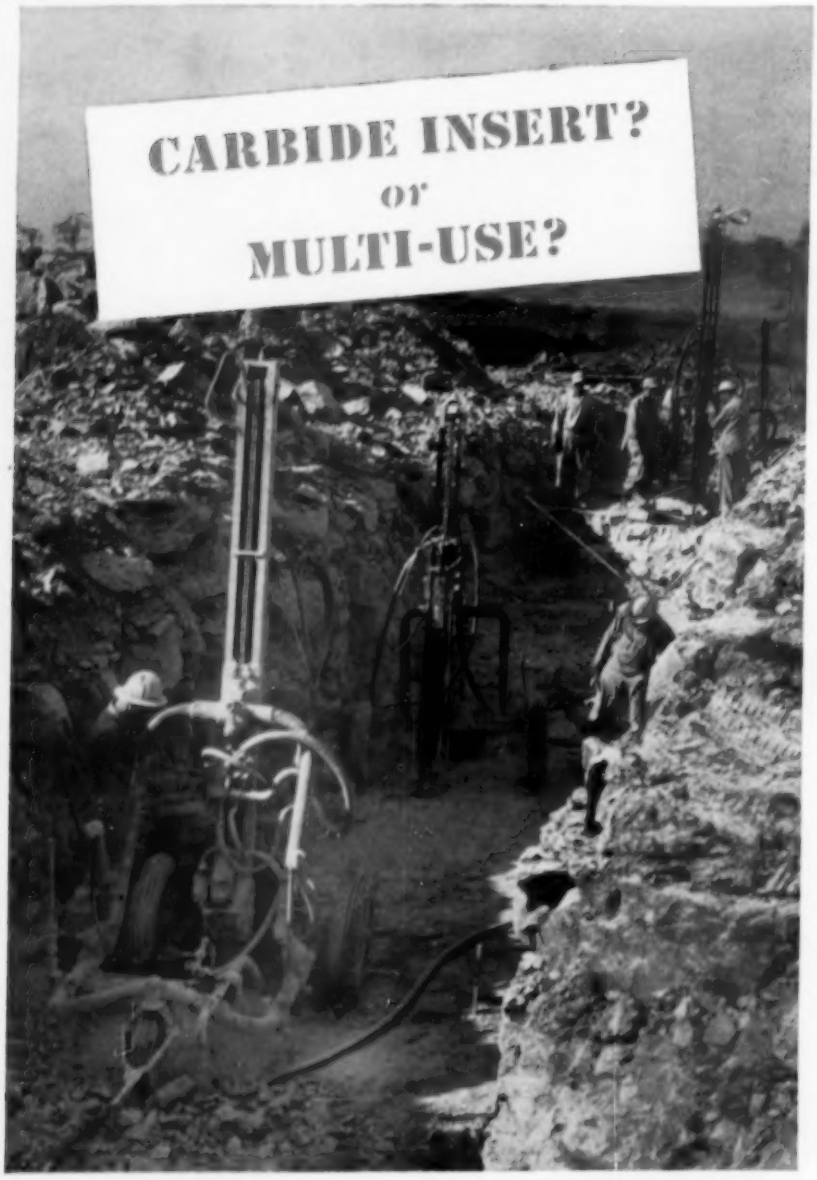
BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957 AMERICAN ROAD BUILDERS ASSOCIATION

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

We get the lowest cost per foot-of-hole with TIMKEN® multi-use bits

... Reports McDowell and McDowell Construction Co.



LOCATION: Industrial plant site, Nashville, Tenn.

OPERATING CONDITIONS: Medium hard limestone.

DRILLING through medium hard limestone on a 232-acre industrial plant site, McDowell and McDowell Construction Co. found they got the lowest cost per foot-of-hole with Timken® multi-use bits.

Under many drilling conditions you, too, can get the greatest saving with Timken multi-use bits. They will give you the lowest cost per foot-of-hole when full increments of steel can be drilled in ordinary ground.

But multi-use bits may not always be your best bet.

In hard abrasive ground, for instance, Timken carbide insert bits will give you higher speeds and greater economy. And for extremely deep holes, constant-gauge holes, or small diameter blast holes, Timken carbide insert bits are again your best bet.

Your drillers will save time with Timken rock bits—multi-use or carbide insert—because they're interchangeable in the same thread series. Dozens of Timken rock bits fit the same drill steel. Change them as fast as the ground changes.

And you get these extra advantages with all Timken rock bits: 1) they're made from the Timken Company's own electric furnace fine alloy steel; 2) they have the special shoulder union developed by the Timken Company to protect threads from drilling impacts.

Find out which Timken rock bit is best for your needs. Call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

your best bet for the best bit for every job

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

Enter 1588 on Reader Card

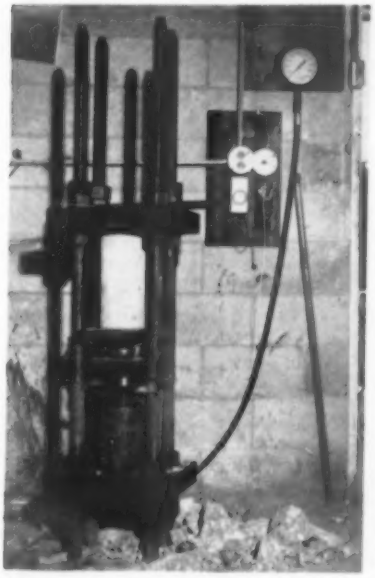
HINTS AND HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Prestress Testing Machine

A SMALL MIDDLE WEST PRESTRESSED CONCRETE CONCERN has built an inexpensive compression and tension testing machine. It was assembled from surplus items at a cost of about $160, and will exert a force of 20,000 lb. in compression.

As a check, duplicate concrete specimens are occasionally sent to an independent laboratory for testing under identical conditions. Results have always checked within expected limits, according to the owners.



Compression testing machine which exerts a force of 20,000 lb.

Cement Hose Rides Tires

IN THE ILLUSTRATION a barge is being unloaded by an 8-in. Fuller-Kinyon pump. The hose that connects the barge line with the shore pipe line takes quite a beating. It is very heavy when empty, but when full of cement it is considerably heavier.

Due to the surging action of the cement in the hose line, it is constantly moving back and forth laterally several inches when the pump is in action. The play is somewhat like that of a loose water hose on the ground when pressure is first applied. The surge in the line causes a scraping action on the dock that would soon wear out the hose. To prevent this wear, the hose is caused to ride on a couple of old truck tire casings.

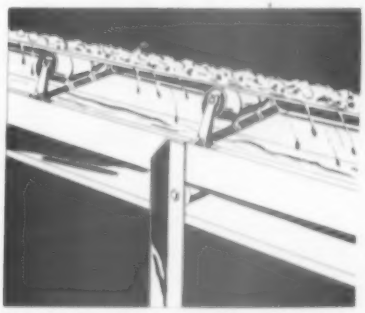
The piece of cement hose shown in the illustration cost in the $700 range so that this wear prevention idea can save an appreciable sum. At this plant, the hose and the portable Fuller-Kinyon pump are swung aboard by a permanently mounted Insley crane.

Old tire casings support cement pump lines to prevent wear

Prevent Dripping from Conveyor to Floor

VERY OFTEN WET STONE taken from a stockpile exposed to the weather presents a problem when it is moved into the plant by belt conveyor for processing. This problem is particularly acute in the winter months when the stone may be frozen and mixed with snow. In the warmer atmosphere of the plant, water accumulates on the conveyor belt and drips to the floor which makes it slippery and hazardous.

At the Dow Chemical Co., Ludington, Mich., lime plant, the problem was solved by installing troughs underneath the belt conveyors to catch and drain the drippings. A stream of water flowing down the troughs keeps them clean. The result has been dry floors and equipment. This interesting idea was passed on by the National Lime Association to the National Safety Council.



Sketch showing how trough catches dripping water from conveyor belt to keep floor and equipment dry

"Spreader" Chute

TO PREVENT SEGREGRATION in truck loading via tunnel belt conveyors at its new Eskridge, Kan., quarry, Concrete Materials and Construction Co. has designed a "spreader" chute which is attached to a 36-in. conveyor head pulley. The illustration on the left, looking into the underside of the chute, shows four baffle plates welded in alternate arrangement. This tends to spread the load to each side of the dump body, thus preventing any crowning. The second view shows the actual loading operation, with the material flow separated into two streams. The tunnel conveyor shown here is a 36-in. x 75-ft. unit, handling up to 800 t.p.h. The company has two other identical conveyors serving the same

(Continued on page 57)

Left: Note baffle arrangement in "spreader chute" **Right:** Chute spreads load into two streams to prevent crowning

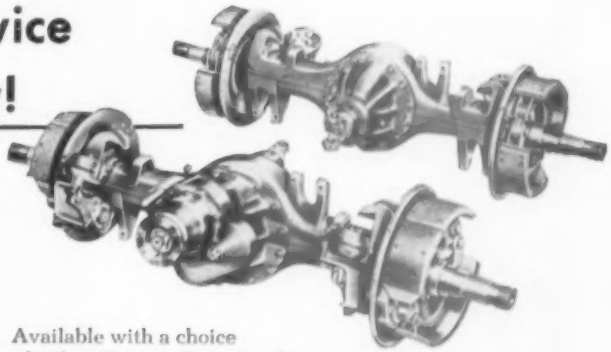
New TDA® lightweight

8,500 EXTRA TON-MILES

highway tandem gives

PAYLOAD A YEAR*

...built almost entirely from interchangeable standard axle parts for easier service and lower parts inventory!



This new lightweight tandem brings two important new advantages to construction truckers—greater payload capacity† and much easier maintenance.

More than two hundred pounds lighter than any other unit of the same capacity, this new TDA tandem will save a trucker 8,500 deadweight ton-miles during an average 75,000 mile year. This means more payload and profit where it counts.

Almost all of the parts—gears, pinions, differentials and brakes—used in this new tandem are interchangeable with parts from Timken-Detroit® standard single axles. This assures operators less down time . . . faster, simpler, more economical service . . . and smaller replacement parts inventory.

Available with a choice of either Timken-Detroit axle connecting groups, or brackets to accept other approved chassis hook-up parts. Plus these additional advantages with the Timken® lightweight tandem:

TDA Inter-Axle Differential Divides Torque Evenly Between Axles . . . and yet permits wheels of one axle to revolve faster or slower than wheels of the other axle. This means both axles are always doing equal amounts of work . . . driving parts and tires last longer.

Driver-Controlled Lockout—with TDA inter-axle differential, the driver can obtain the advantages of straight-through drive under slick or icy conditions by locking out the differential at *any* driving speed.

Big, Dependable Hypoid Gears rotate in conventional direction for maximum gear and bearing life.

This new highway tandem insures new payload profits, faster, easier service and operating economies for construction truckers everywhere. For complete information contact your nearest vehicle dealer or branch.

*based on 75,000 highway miles a year.
†for the same gross vehicle weight.

TIMKEN Detroit AXLES

TIMKEN-DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted D A Standard
TRADE MARK REGISTERED

World's Largest Manufacturer of Axles for Trucks, Buses and Trailers

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

©1956, R.S.&A. Company

an ACCO product

American Cable TRU-LAY VHS 15% STRONGER

New VHS Dragline Lasts 73% Longer

Draglines on the excavator above, used in coal stripping operations at the Kingston Mining Company, Plymouth, Pa., get really rough service. The best Improved Plow Steel lines formerly lasted only 700 hours.

Now, however, lines of new TRU-LAY VHS are averaging 1,250 hours—giving 73% longer service life.

Records like these are being duplicated by VHS Draglines all over the country. For new VHS is tougher—more wear resistant. And it has all the advantages of preformed construction.

STRONGER AND SAFER

New VHS is 15% stronger than Improved Plow Steel, which was the strongest available until now. Its additional strength enables you to handle heavier loads with the same diameter line. And it gives you a higher factor of safety during the entire service life of the rope.

FOR SHOVEL HOIST ROPES AND SCRAPER ROPES, TOO

TRU-LAY VHS was developed particularly for the toughest applications in the construction and mining industries—draglines, shovel hoist ropes and scraper ropes. It stands up better under the rough treatment these ropes get.

LESS "DOWN TIME"—CUTS COSTS

Because it's tougher and more wear resistant, TRU-LAY VHS rope lasts longer, costs less to use and cuts "down time" of equipment for wire rope replacement.

TRU-LAY VHS ropes are easy to order. Just ask for TRU-LAY VHS Shovel Hoist Ropes, Scraper Ropes or Draglines in the size you want. You don't need any complicated specifications.

Your American Cable Distributor has TRU-LAY VHS *in stock now. See him or write to the nearest American Chain & Cable Company Office.*

ACCO American Cable Division
AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.

Enter 1561 on Reader Card

stockpile (minus 1½-base coarse stone) and is shipping at a 1000 t.p.h. rate to the Kansas Turnpike.

Electric Drill Straightens Wire

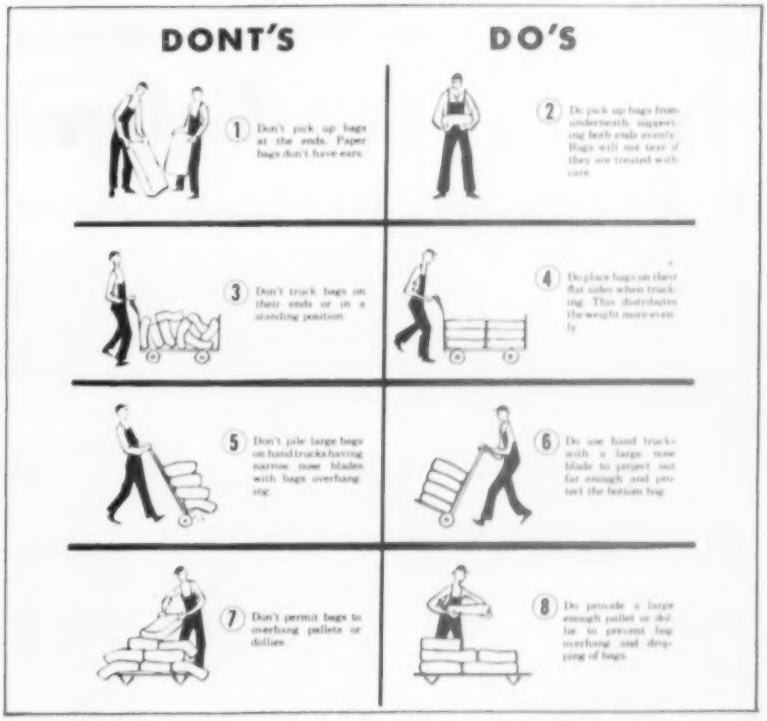
IN THE ILLUSTRATION may be seen a workman using an electric drill to twist and straighten reinforcing steel in one operation. The reinforcing wire comes in 100 lb. coils, and it is cut in 200-ft. lengths. The electric drill

Workman using electric drill to twist and straighten reinforcing wire

used to twist these lengths takes out the curve caused by the coil, and it also makes easier the shaping operation to fit the forms.

Pipe for Conveyor Supports

MOORMAN SAND & GRAVEL CO., Middletown, Ohio constructed the vertical supports of the A frame for a belt conveyor trestle, using Armco spiral welded steel pipe, 8⅝ in. diameter. The spiral welding process is said to impart great strength to the pipe. A special analysis spiral welded pipe also is widely used in dredging.


DONT'S
DO'S
1 Don't pick up bags at the ends. Paper bags don't have ears.
2 Do pick up bags from underneath, supporting both ends evenly. Bags will not tear if they are treated with care.
3 Don't truck bags on their ends or in a standing position.
4 Do place bags on their flat sides when trucking. This distributes the weight more evenly.
5 Don't pile large bags on hand trucks having narrow nose blades with bags overhanging.
6 Do use hand trucks with a large nose blade to project out far enough and protect the bottom bag.
7 Don't permit bags to overhang pallets or dollies.
8 Do provide a large enough pallet or dollie to prevent bag overhang and dropping of bags.

Suggested Do's and Don't's for handling multiwall paper bags

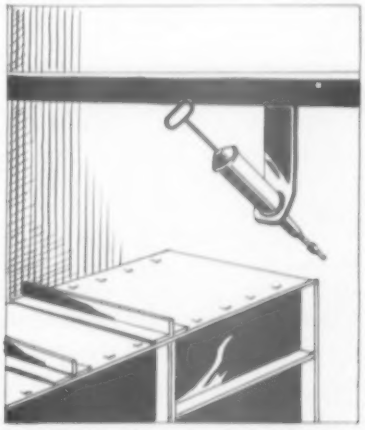
Proper Bag Handling

IN THE ILLUSTRATION may be seen some excellent suggestions for the handling of multiwall paper bags. This information was prepared as part of a colorful poster by Fulton Bag & Cotton Mills, P. O. Box 198, New Orleans 3, La., copies of which can be obtained by writing the company.

Handy Grease Gun Holder

AT ONE OF THE SOUTHERN CEMENT PLANTS, the grease gun holder shown in the illustration was devised to simplify good housekeeping and proper maintenance The grease gun holder or bracket is mounted on the inner side of a guard rail.

By replacing the grease gun in the holder after each use, the employes



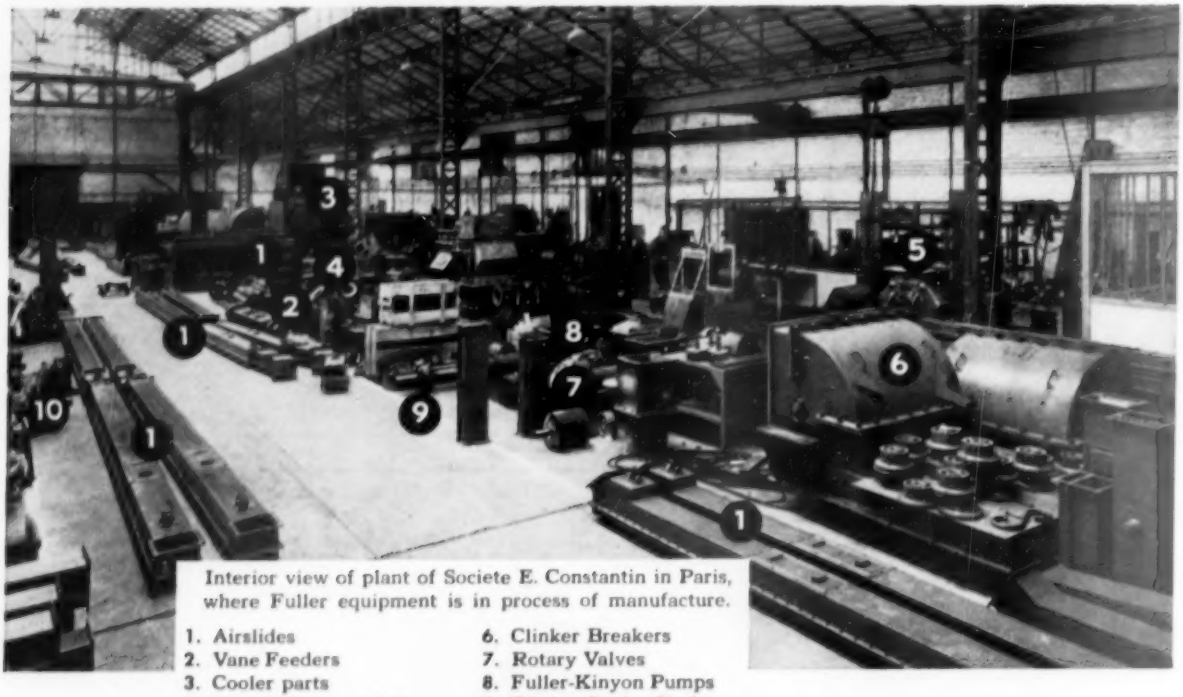
Grease gun holder mounted on inner side of guard rail prevents grease from dripping into aisle and it is within convenient reach of maintenance employes

always know where to locate it, the gun will not be as readily mistreated and there will be less danger of excess grease dripping into the aisle. This interesting good housekeeping idea was described in the Safety Newsletter, issued by Cement and Quarry Section, National Safety Council.

Vertical members of A frame support for belt conveyor are made of spiral welded pipe

In France
(and in England, Germany, Australia, and Japan)

You Can Buy Fuller Equipment In Foreign Currency Available To You



Interior view of plant of Societe E. Constantin in Paris, where Fuller equipment is in process of manufacture.

1. Airslides
2. Vane Feeders
3. Cooler parts
4. Fuller-Kinyon valves
5. Roll Feeders
6. Clinker Breakers
7. Rotary Valves
8. Fuller-Kinyon Pumps
9. Clinker Cooler Shaft
10. Bulk Cement Unloaders

American consulting engineers concerned with overseas installations, as well as foreign customers buying within their own countries, are obtaining a wide range of Fuller-engineered products manufactured abroad, and paying for them in whatever currency is available to them.

Foreign manufactured Fuller equipment comprises Fuller-Kinyon Conveying Systems, Airslide® Conveying Systems, Airveyor® Pneumatic Conveying Systems, clinker coolers and heat recuperators, clinker breakers, vane and roll type material feeders, rotary valves, bulk cement unloaders, and related accessories. Fuller's foreign affiliates, licensees, and sales representatives are furnishing foreign manufactured Fuller equipment to the cement, heavy chemical, plastics, food, and construction industries.

Foreign customers and their engineers are obtaining the benefits of the combined efforts of Fuller's engineering staff headquartered at Catasauqua, Pa., augmented by the engineering organizations of its foreign associates.

MANUFACTURING AFFILIATES
Societe E. Constantin—Paris
Constantin (Engrs.) Ltd.—London

LICENSEES
Claudius Peters AG—Hamburg
Babcock Hitachi KK—Tokyo
John Carruthers & Co. Pty. Ltd.—Sydney

SALES REPRESENTATIVES
Asano Bussan Company—Tokyo and Osaka
Cory-Wright & Salmon Ltd.—Wellington
Constantin (Engrs.) Ltd.—Johannesburg
Jose M. Alonso de Areyzaga—Buenos Aires

FULLER COMPANY
102 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Chicago • San Francisco • Los Angeles • Seattle • Kansas City • Birmingham

FULLER COMPANY GENERAL AMERICAN

Fuller
pioneers in harnessing AIR

G-137
3748

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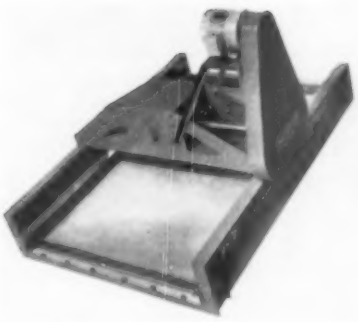
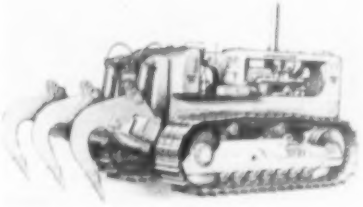
NEW MACHINERY



High Motor Mount

THE DEISTER CONCENTRATOR CO., Fort Wayne, Ind., has announced a High Motor Mount for its Model E Leahy Heavy Duty Vibrating Screen in meeting certain conditions of installation. The High Motor Mount permits swinging the motor inward, to eliminate the extension beyond the side edge of the screen frame, and leaves only the width of the drive guard as a projection. Where a large number of screens are to be placed as close as possible, the new motor drive mounting is a space saver. There are other instances where it is desirable to get the motor mounted at a greater distance from the screen cloth where material is processed.

Enter 300 on Reader Card



Tractor-Mounted Ripper

Caterpillar Tractor Co., Peoria, Ill., announces the No. 9 Ripper, designed for use with Caterpillar D9 Tractor. The complete ripper consists of two mounting brackets, two hydraulic cylinders, one beam assembly, and three teeth. It weighs 10,830 lb. Mounted on a bevel gear case through a special drawbar bracket group, the ripper is operated hydraulically by two hydraulic cylinders working in conjunction with the Caterpillar No. 50 Hydraulic Control. It is driven from a "live drive" hydraulic pump which permits the ripper to be raised and lowered independently of the flywheel clutch or torque converter. A control feature is the automatic kickout which throws the hydraulic control lever back to "hold" position at the end of the "raise" stroke.

Enter 301 on Reader Card

Rectifier Welder

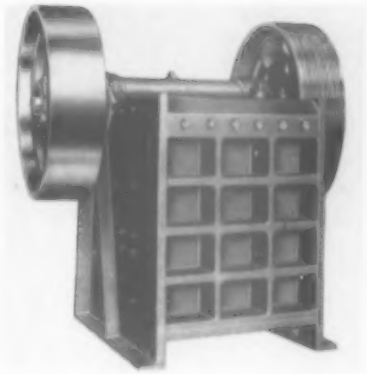
HOBART BROTHERS CO., Troy, Ohio, has developed a new rectifier welder with "Diverter Path" control. Features are a recessed control panel with polarity reversing switch; and three coarse current adjustments with rheostat control for fine current adjustments. The rheostat can be removed for remote control. The welder has both thermostatic and current overload protection. A magnetic line contactor is supplied. The unit is available in 300 and 400 ampere models.

Enter 302 on Reader Card

Pallet Bag

ST. REGIS PAPER CO., New York, N. Y., has developed a new pallet bag with "squared off" package. The length of the pasted bag is shortened for improved pallet loading and the size of the gussets is increased to obtain the same volume. A small sleeve and large valve prevent siftage. After the bag is filled, it moves on a conveyor to the vibratory flattener which flattens the bag and contributes to easy palletizing.

Enter 303 on Reader Card



High-Capacity Jaw Crusher

MCLANAHAN AND STONE CORP., Hollidaysburg, Pa., is producing a series of high-capacity jaw crushers of the overhead eccentric type, with force-feed action and long jaw design. McLanahan Jawmasters are produced in 13 sizes, ranging from 10- x 16-in. to 40- x 48-in. Capacities up to 750 ton are offered. Roller bearing construction throughout and extra heavy welded-steel frames are features. The crushers are designed to operate at close allowable discharge settings to produce a uniform product.

Enter 304 on Reader Card

Power Steering Unit

SHERMAN PRODUCTS, INC., Royal Oak, Mich., has added to its tractor accessory line a hydraulic power steering unit for attachment to the Ford-son-Major diesel tractor. The device comprises a combination hydraulic Servo valve and cylinder that is actuated by the pitman arm of the tractor steering column. Hydraulic power is supplied by a self-contained pump and reservoir unit, driven by a v-belt from the generator pulley on the tractor. The unit is said to eliminate side thrusts and shocks, to make steering

(Continued on page 63)

MR. ROY WALTON
President,
Western Concrete and Equipment Co., Los Angeles.

1956 Ford T-800. Maximum GVW 45,000 lb.; GCW 65,000 lb. New thermostatically controlled cooling fan available at slight extra cost.

BIG FLEET OWNERS BUY MORE FORD

"Here's how we get a $5,280 daily bonus with our 85 Ford Trucks

"Our Ford T-800's carry 2,000 lb. more concrete than other trucks of comparable GVW. They earn us $6 extra per trip. When they make 880 trips a day, we get a bonus of $5,280!

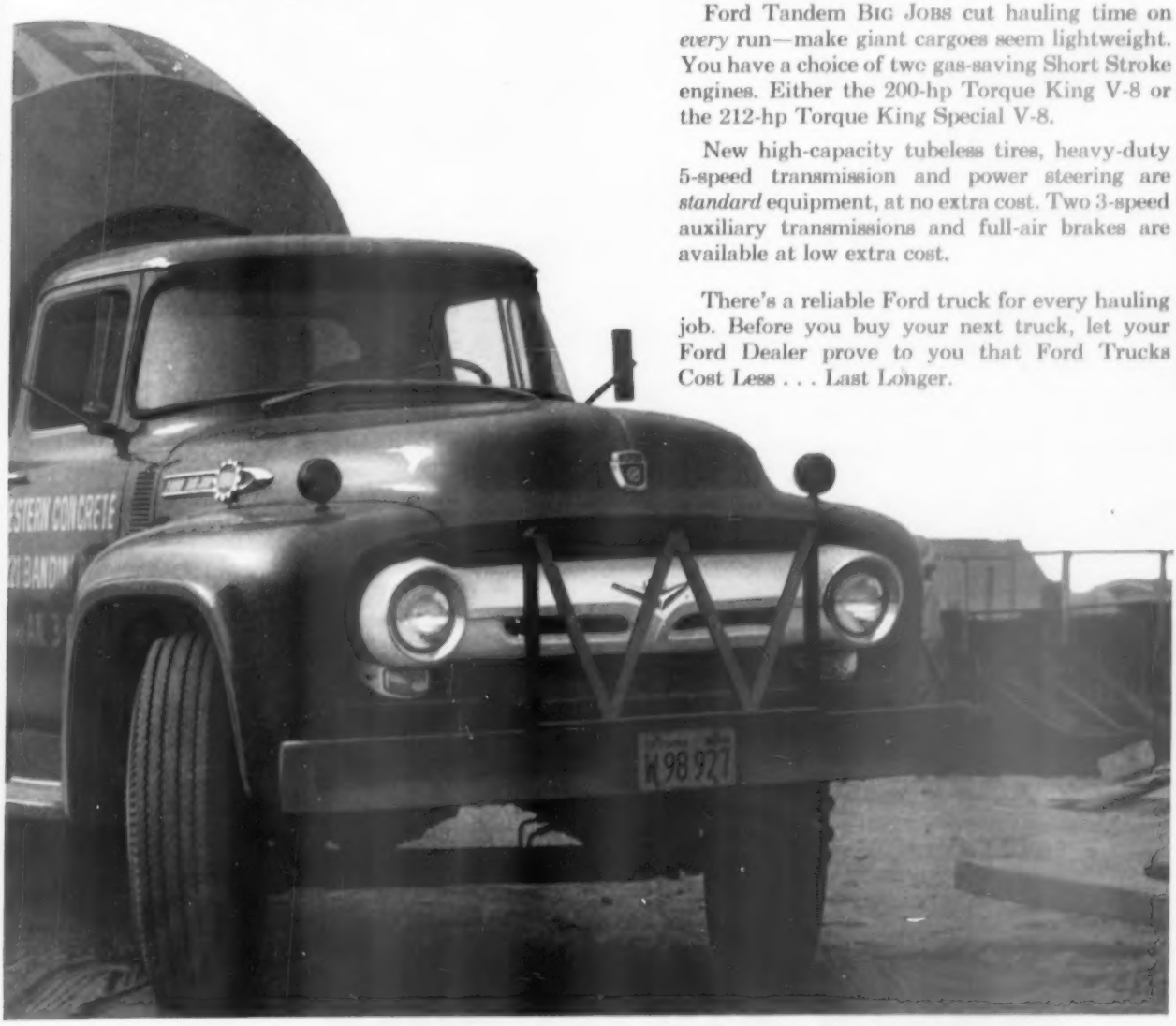
"The lighter weight of our Ford T-800's allows a 28,000 lb. payload," says Mr. Walton. "With Fords we haul 6,160 yd. of concrete in 880 trips during an 8-hour day. Competitive trucks we have tried, require 948 trips to do the same job. *That's how Ford trucks cost less for us.*

"And that's why we've used Fords since 1944," Mr. Walton explains.

Ford Tandem BIG JOBS cut hauling time on *every* run—make giant cargoes seem lightweight. You have a choice of two gas-saving Short Stroke engines. Either the 200-hp Torque King V-8 or the 212-hp Torque King Special V-8.

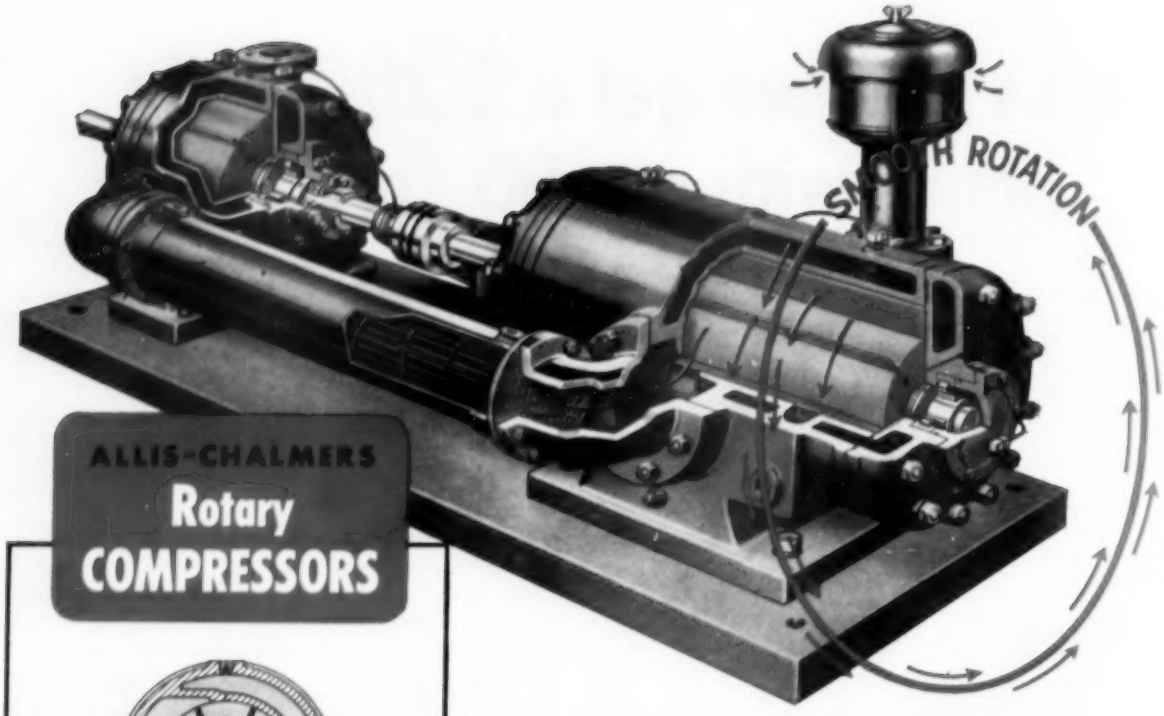
New high-capacity tubeless tires, heavy-duty 5-speed transmission and power steering are *standard* equipment, at no extra cost. Two 3-speed auxiliary transmissions and full-air brakes are available at low extra cost.

There's a reliable Ford truck for every hauling job. Before you buy your next truck, let your Ford Dealer prove to you that Ford Trucks Cost Less . . . Last Longer.



TRUCKS THAN ANY OTHER MAKE

Enter 1627 on Reader Card



ALLIS-CHALMERS

Rotary COMPRESSORS

How Ro-Flo units operate: Centrifugal force moves vanes to outside wall to form air chamber.

Smooth-running Ro-Flo Compressors cut vibration, and provide...

Constant Efficiency

YEAR after year there is no change in the efficiency of a *Ro-Flo* compressor.

Efficiency always remains uniformly high even if parts wear. Here's the reason:

During operation the sliding vanes of the rotor (see cross section above) press against the cylinder wall to form air cells. Even if these vanes wear, the centrifugal force holds them in contact with the cylinder wall so that the air cell never changes and efficiency and air flow remain constant.

Rotary Means Smooth Operation

Smooth rotation cuts vibration ... eliminates need for heavy foundations. Small *Ro-Flo* units can be bolted directly to the floor. Large units need only a simple slab.

Maintenance is low. There is no wear and tear on compressors from shock and vibration ... no pistons and valves.

A Type and Size for Every Need

Single-stage units for pressures to 50 pounds gauge, and volumes from 42 to 3245 cfm. Two-stage units for 250 to 1800 cfm at pressures from 60 to 125 pounds gauge.

Single and two-stage vacuum pumps for vacuums to 0.3 inch mercury absolute from 22 to 5950 cfm.

GET INFORMATION — Call your nearest A-C office or write for bulletins 16B8244 (2-stage) and 16B8126 (1-stage). Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

Ro-Flo is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-5134

Enter 1513 on Reader Card

easier when the front of the tractor is weighed down by a heavy attachment, such as a front-end loader. Manual steering remains should the hydraulic system fail.

Enter 305 on Reader Card

"Tilted Valve" Multiwall Bag

ARKELL AND SMITHS, Canajoharie, N. Y., has announced the development of a "tilted valve" multiwall bag. The principle of the tilted valve is that the flow of material is altered during filling to force the valve upward and closed, eliminating sifting both during and after filling. The new valve is also said to facilitate fitting the bags on filling spouts.

Enter 306 on Reader Card

Portable Rotary Drill

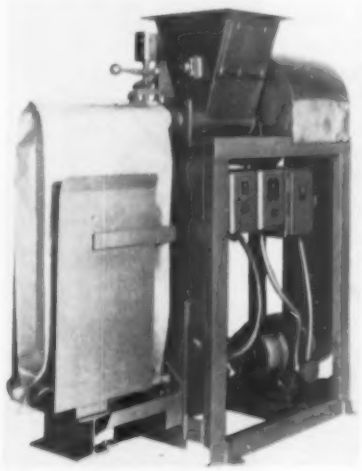
HOUSTON TOOL CO., Santa Susana, Calif., has introduced "Mighty Midget", a 125-lb. rotary drill which can drill a 1¾-in. hole through 100-ft. of difficult formation. The Mighty Midget employs the Hi-Vac drilling system which requires no water or air supply for circulation. It also has swivel transmission which permits operation through a 360 deg. range. The one-man drill can be carried in the trunk of a car, pick-up, or jeep, and sets up in ten minutes.

Enter 307 on Reader Card

Steel Shield Tires

UNITED STATES RUBBER CO., New York, N. Y., announces a new line of truck tires, Super Fleetmasters, having a steel wire shield between tread and carcass. The tires are designed for heavy service equipment used in mining, quarrying and road construction. The shield protects the tread from cut and rupture damage. Wide angle grooves are designed to minimize stone retention, and three-rib tread, to increase stability and improve steering. The tires may be used on front, drive and trailing wheels. They are available in sizes from 7.50-20 through 11.00-24. Larger sizes, ranging from 12.00-24 through 16.00-25, have a nylon cord body and are primarily for off-the-road use.

Enter 308 on Reader Card



Volumetric Packer

H. L. STOKER CO., Claremont, Calif., has introduced an improved Model VP Volumetric Packer, which is said to apply the automation principle to the bag packer. Bulk material being packaged is employed to act as the motivating power source. Uniformity of content volume with automated settling of material are among the claims for the unit, along with higher productivity with minimum of care.

Enter 309 on Reader Card

Portable Heater

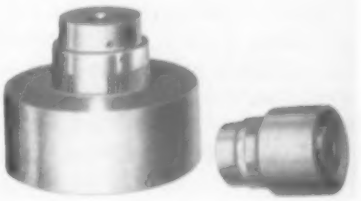
THE SILENT GLOW OIL BURNER CORP., Hartford, Conn., is producing a portable heater designed to deliver 1,000,000 B.t.u.'s p.h. or 7000 c.f.m. of heated air. It is recommended for drying sand and other concrete aggregates. A four-blade fan on the front end forces out the hot air which is produced by the oil burner on the opposite end of the heater. The unit, weighing 900 lb., has a stainless steel combustion chamber, and an all-steel, electrically welded body set on heavy duty rubber-tired wheels. Features also include automatic and safety controls as standard equipment.

Enter 310 on Reader Card

Suspended Separation Magnet

STEARNS MAGNETIC INC., Milwaukee, Wis., has announced a new line of suspended separation magnets for use with conveyor systems. Suspended over the head pulley or anywhere along the belt, the magnet draws out tramp iron in the flow of material. The magnets are available in a variety of standard sizes or may be built to individual specifications.

Enter 311 on Reader Card



Brake Drum Coupling

LOVEJOY FLEXIBLE COUPLING CO., Chicago, Ill., announces its new type coupling incorporating a brake drum flange on the outer diameter. The feature provides a compact drive arrangement and is useful where shaft length or distance between two units is at a premium, the brake drum requiring no more space than coupling itself. The coupling is available in eight standard sizes, with hp. ratings from 2 to 40 at 1750 r.p.m. Maximum bores of the hub body range from 1-in. to 2½-in. Drum body bores are made

(Continued on page 67)

NOW—PRECISION-MADE

Unique Optical Comparator Assures Accurate

As the first to apply the technique of micrometric projection to the manufacture of wire screen cloth, Hewitt-Robins can now meet the most exacting specifications every time. With the use of this Optical Comparator, an unusually high degree of accuracy can be obtained because all measurements and comparisons are made on a greatly enlarged image rather than on the object itself. There is no direct contact with any part nor can there be any deformity caused from measuring pressure.

The actual wire sample is projected on a master chart with such magnification that the operator can instantly see and correct the smallest variation in the specified crimp. As a result, the crimping machine can be adjusted to three decimal places to obtain maximum uniformity of product.

This is one more special Hewitt-Robins technique for assuring you the finest in wire screen cloth for every sizing, separating or screening operation. Hewitt-Robins wire screen cloth is tougher . . . resists extreme abrasion . . . lasts longer. Every piece is tightly woven with precisely accurate openings and will provide you with higher operating efficiency and lowest cost per ton.

Hewitt-Robins screen cloth is obtainable in a wide variety of weaves in plain steel, spring steel, oil-tempered steel, stainless steel and many other alloys . . . is carried in stock in both Super and Gyraloy grades, 3/16" openings and coarser.

INDUSTRIAL DIVISIONS PRODUCTS

INDUSTRIAL HOSE • VIBRATING CONVEYORS
CONVEYOR BELTING • CONVEYOR MACHINERY
VIBRATING SCREENS • DESIGN, MANUFACTURE, ENGINEERING AND ERECTION OF COMPLETE BULK MATERIALS HANDLING SYSTEMS
"JONES" POWER TRANSMISSION EQUIPMENT
"GLIDE RIDE" THE NEW MOVING SIDEWALK

HEWITT-

STAMFORD,

SCREEN CLOTH

Quality Control

New Optical Comparator for testing the crimp of wire screen cloth compares samples with master chart. Projected image has been magnified 10 times for precision comparison by D. K. Wallace, Superintendent of Hewitt-Robins Square Mesh Department.

ROBINS

CONNECTICUT

HEWITT-ROBINS VIBRATING SCREENS

Hewitt-Robins Vibrating Screens are manufactured in a variety of styles and a wide range of sizes for every need of industry.

GYREX SCREENS

General-purpose, positive-stroke, 4-bearing screen with amazing versatility of application and an unsurpassed record for stamina in service.

STYLES M AND MS VIBREX SCREENS

Full-floating, unbalanced, pulley-type, 2-bearing screen. Offers sharp sizing of a wide variety of materials at low cost.

STYLE J VIBREX SCREENS

General-purpose screen applicable to a wide variety of screening operations. Wide range of sizes for suspended mounting.

STYLE HS HIGH-SPEED VIBREX

For fine screening operations (up to 100-mesh in some cases). Highly effective circle-throw screening action.

ELIPTEX SCREENS

Exclusive 3-way elliptical motion for sharpest sizing and most effective dewatering. Horizontal-operating flat screens.

HI-G SCREENS

Revolutionary new "modified resonance" principle permits larger screens and bigger capacities at less power. Unusually sharp screening action. Can be made in sizes larger than any other vibrating screen on the market.

FOR SERVICE AND INFORMATION ON BELTING AND HOSE CALL YOUR LOCAL HEWITT-ROBINS INDUSTRIAL SUPPLY DISTRIBUTOR LISTED IN THE "YELLOW PAGES"

Enter 1503 on Reader Card

Illustration from Agricola's De Re Metallica (1621)

Arduous Work—Small Production

In centuries past, the production of metals could be measured by handfuls. Small wonder when comminution was done by a hammer and beneficiation was limited to hand-picking.

Fortunately, today's modern processing plants treat many tons of ore and produce many tons of metals, thus making possible our "metal age" civilization. This large production requires modern grinding methods which in turn utilize such grinding media as those produced by CF&I. The grinding balls and grinding rods produced by CF&I are *always* made from special analysis steels with the ideal balance between toughness and hardness to assure optimum grinding ability and maximum wearing ability.

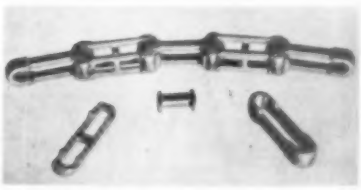
THE COLORADO FUEL AND IRON CORPORATION CF&I 3695

Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth Grand Junction • Houston • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oakland • Oklahoma City • Philadelphia • Phoenix Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane • Wichita • CF&I OFFICE IN CANADA: Toronto

Enter 1509 on Reader Card

to motor shaft size specifications. Distance between shafts runs from ½-in. to 1⅝-in. Cushions are one-piece spider type.

Enter 312 on Reader Card



Rivetless Forged Chain

TRANSUE AND WILLIAMS STEEL FORGING CORP., Alliance, Ohio, has developed rivetless forged chain for heavy conveying operations, tested for breaking strength of over 200,000 lb. The chain, weighing 16-lb. per ft., has precision machined links and coin pressed pintles for uniform bearing and easy assembly. The design permits flexing laterally as well as around sprockets, so that the chain travels freely on a close radius curve. Standard material is forging quality steel, heat-treated; but the chain can also be furnished in special heat and acid-resisting materials. Smaller sizes available include 9-in., 6-in. and 4-in. pitch. Trolley brackets and other accessories can be supplied.

Enter 313 on Reader Card

Heavy Duty Wagon Drill

LE ROI DIVISION, Westinghouse Air Brake Co., Milwaukee, Wis., announces a new heavy-duty wagon drill, the DR40. The drill features a feed shell well behind the center line of the large wheel axles to provide a substantial drilling carriage, and an air motor feed to eliminate most sticking of steel. Designed for vertical or horizontal drilling in hard formations, the DR40 is light in weight, making it maneuverable in rough terrain. Added strength is obtained through the use of a lightweight, welded tubular U bar. Adjustable swivel wheels are quickly locked into position for line or face drilling. Recommended for use with the wagon drill, the D14DR drifter, is used with a 13-ft. feed shell having a feed travel of 10-ft.

Enter 314 on Reader Card

Automatic Cement Sampler

DENVER EQUIPMENT CO., Denver, Colo. is introducing a new Denver Cement Sampler, having dust-proof construction and completely automatic operation. The sample cutter is attached to a vertical shaft which rotates in a circle. The cutter passes through the downward flowing feed stream, cuts a sample from the entire stream, and returns to a stationary position. Contamination of samples is prevented by means of a solenoid-activated cover which fits over the cutter opening when the unit is not rotating. The unit shown is a 20-in. Automatic Denver Cement Sampler. Continuously rotating simplex, duplex or multiple units can also be supplied. Manual controls can be provided to operate when desired on an automatic unit.

Enter 315 on Reader Card

Portable Crushing Plant

PIONEER ENGINEERING WORKS, INC., Minneapolis 13, Minn., is introducing a new single pass portable crushing plant, the Pioneer No. 8. It is mounted on a single rubber-tired chassis for mobility. Adaptability to various jobs is provided by choice of two sizes of jaw crushers, and either a front dolly or semi-trailer hitch. Rejection of sand by a 16-in. x 20-ft. sand conveyor is possible, and various ways of feeding and delivering material can be used. All highway axle load requirements are met by the plant, the company states.

Enter 316 on Reader Card

Self-Propelled Scraper

WOOLDRIDGE MANUFACTURING DIVISION, Continental Copper and Steel Industries, Inc., Sunnyvale, Calif., announces its new Cobra Quad, three-axle type, self-propelled scraper. Comprised of a 300-hp. diesel four-wheel tractor with a two-wheel scraper attached through a heavy universal ball and socket yoke connection, the unit is rated at 26-cu. yd. heaped and 20-cu. yd. struck, with load-carrying capacity of 56,000 lb. A fluid coupling drive, air actuation of clutch, transmission and winch, and hydraulic steering are features of the new model. An extra heavy duty helical gear syncro-mesh transmission provides nine speeds forward and two in reverse, with haul speeds over 32 m.p.h.

Low profile bowl design, rear fulcrum application of power to the cutting edge and the Wooldridge "boiling bowl" loading principle are said to provide ease and speed of loading.

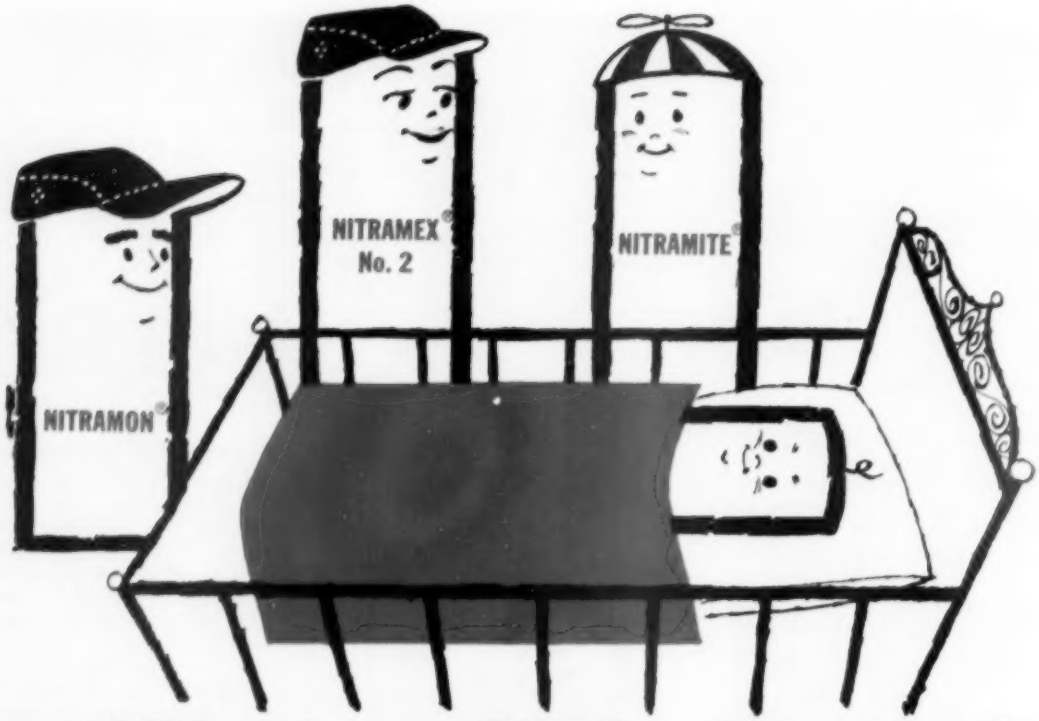
Enter 317 on Reader Card

Crushing, Screening Plant

IOWA MANUFACTURING CO., Cedar Rapids, Ia., has redesigned the Cedarapids Junior Tandem crushing and screening plant. The 42-in. x 10-ft., 2½ deck screen has been enlarged to increase screening capacity and to add flexibility for producing from one to three products simultaneously in sizes ranging from 2-in. road ballast down to minus ¼-in.

The owner can choose the crusher sizes that will fit his conditions—the

(Continued on page 69)



New addition to our Blasting Agent family—

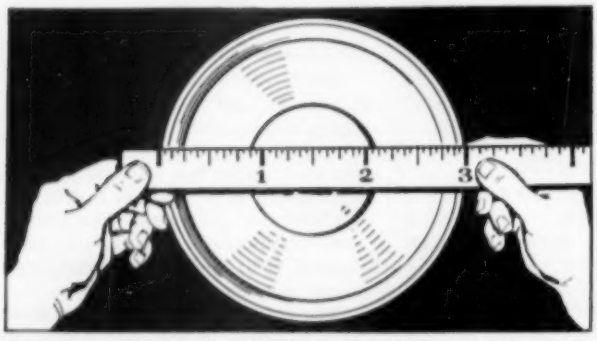
DU PONT NITRAMEX® Nº 3!

Non-headache, non-nitroglycerine product now available in 3" and 3½" diameters

"Nitramex" No. 3 comes in heavy fiberboard cylinders with sealed metal ends, 24" long and 3" or 3½" in diameter. In wet work it can be loaded one day and shot the next, in depths of water up to 25 feet. It must be initiated with a special "Nitramex" No. 3 Primer, which can be primed with either Primacord or an electric blasting cap. For the present, it is available only in the eastern half of the United States.

The greater safety and economy of Nitramon® and Nitramex® No. 2 have long been enjoyed by consumers in large-diameter holes. Lately, Du Pont Nitramite® entered the picture. Now, new Nitramex® No. 3 makes the increased safety of Du Pont's Blasting Agents available to operators using smaller, intermediate-diameter holes. And we're experimenting and testing it to develop even smaller diameters.

In real hard-shooting rock, "Nitramex" No. 3 plus Pelletol No. 1 will replace 60% Special Gelatin and give the same excellent fragmentation as large-diameter-hole users have been getting with "Nitramex" No. 2 and Pelletol No. 1. Get the full particulars from your Du Pont man, or write us. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Del.



Powerful, new "Nitramex" No. 3 is available in 3" and 3½" diameters.

Enter 1562 on Reader Card

DU PONT
BLASTING AGENTS

Products of Du Pont Research

DU PONT

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

10- x 36-in. jaw crusher where large amounts of oversize are encountered, or the 10- x 24-in. jaw crusher in average pit conditions. Secondary crushing is handled by either a 24- x 16-in. or a 30- x 18 in. roll crusher.

Crusher sizes can be matched or mixed in any combination to adapt the unit to whatever crushing conditions are met. Other standard features of the Junior Tandem are a mono-type elevating wheel; separate clutch control on the screen; new delivery conveyor backstop; new belt wipers and self-cleaning pulleys; new type adjustable eccentric on the reciprocating feeder; larger hopper. A sand ejector screw for discharging either wet or dry sand onto the sand conveyor, and a spray bar attachment for producing washed aggregates are optional equipment.

Enter 318 on Reader Card

Walking Dragline

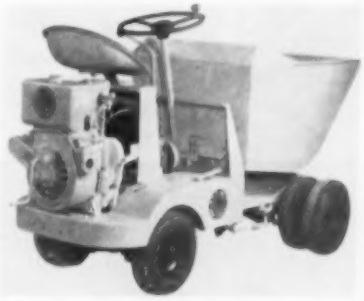
PAGE ENGINEERING CO., Chicago, Ill., announces a new line of single deck walking draglines, all powered by Page-developed V-type horizontal diesel engines. An exclusive feature of Page Models 721, 723 and 728 is the Becket Staff and cables providing support for the boom at three equally spaced points along its length. The engines were designed with two banks of horizontal cylinders mounted one above the other. Connecting rods of both are joined to the same crankshaft journal for smoother power strokes and increased power. The engine has automatic "power demand" control which reduces or increases engine output as required by the machine going through its operating cycle. Additional features are the centralized lubricating system and the electric oil pre-heater.

Enter 319 on Reader Card

Impact Breaker

PIONEER ENGINEERING WORKS, INC., Minneapolis 13, Minn., is now marketing the Pioneer Cuber Senior, Model 3648. A dual rotor, up-running breaker featuring a multi-stage, triple action reduction principle, the Cuber Senior is suitable for stationary or portable installations and for both primary and secondary breaking of non-abrasive stone. It has an adjustable rock-deflecting baffle, provision for varying the speed of the hammers, and an adjustable discharge grate; thus it is designed to produce a wide range of concrete and bituminous aggregate sizes with full gradation control. A lower feed opening makes possible direct shovel-loading in portable operations and a lower truck ramp height for stationary units.

Enter 320 on Reader Card



Materials Handling Unit

KWIK-MIX CO., Port Washington, Wis., a subsidiary of the Koehring Co., Milwaukee, has announced Model R-15 Moto-Bug, a "3 in 1" materials handling unit. Automatic power flow transmission is standard equipment, resulting in increased speed to 12 m.p.h. Power ratio of 4 to 1 multiplies engine torque range as much as 200 percent. Power flow output is corrected automatically in direct ratio to power requirements without shifting gears or using a clutch pedal.

Enter 321 on Reader Card

Wheel Winch

TERMAC, Libertyville, Ill., has developed a wheel winch for four wheel drive bucket loaders. Operating from the loader controls, the unit utilizes the ability of this type of loader to raise the front drive wheels and disconnect the rear drive axle. With the front drive wheels off the ground and powered, the wheel-mounted winch rolls up the cable pulling the load toward the stationary vehicle.

Where it is desired to move the load and vehicle at the same time, or to move the load over a distance exceeding the cable length, the loader wheels are left on the ground and in all wheel drive. With the cable secured to the load, a differential between the wheel rolling radius and cable drum diameters allows the load to move at a slower speed than the loader. When the cable spool is nearly empty the rear axle is put in throwout, the front wheels raised and the load towed in close to the loader. When not being used for winching the cables are removed from the open top cable guides on the bucket end sheets and wound onto the drum with the hooks retained by tension springs. There are four alternate positions for attaching the spring. The Termac Outboard Winch Model TOW I has a capacity for 165-ft. of ¾-in., or 350-ft. of ½-in. diameter cable.

Enter 322 on Reader Card

Gyratory Crusher

STRAUB MANUFACTURING CO., Oakland, Cal., is introducing a 28-in. gyratory fine reduction crusher. It is available with fine, medium and coarse bowl liners to suit different feed sizes and products. Receiving openings range from 1¾- to 3¾-in. Discharge settings range from ¼- to 1¼-in. Capacity ranges from 10 to 75 t.p.h.

Enter 323 on Reader Card

Bronze Welding Rods

AIR REDUCTION SALES CO., New York, N. Y., announces three new extruded, heavy coated bronze oxyacetylene welding rods, especially designed for braze welding and welding malleable iron, cast iron, brass and bronze with dirty, oily or greasy surfaces. Three types are available: Airco No. 20 Bronze Rod for general braze welding and welding; Airco No. 22 Manganese Bronze Rod for high strength welds; and Airco No. 27 Low Fuming Bronze Rod.

The rods are made in four diameters —⅛-in.; $\frac{3}{16}$-in.; ¼-in.; and $\frac{5}{32}$-in. Airco 20, 22 and 27 also are available with a dipped coating for clean production work.

Enter 324 on Reader Card

Completed in 1954, this Research-Cottrell precipitator cleans the gases from Kiln No. 5 of Missouri Portland's Prospect Hill Plant. The gases from this rotary wet process kiln pass from the kiln end housing, through the precipitator, induced draft fan and then up the stack.

Rapping puffs were eliminated in this installation with Research-Cottrell's electronically controlled M. I. Rappers. This method of continuous, sequential rapping avoids dust re-entrainment in the gas stream and assures optimum precipitator performance at all times.

Research-Cottrell Precipitator at Missouri Portland

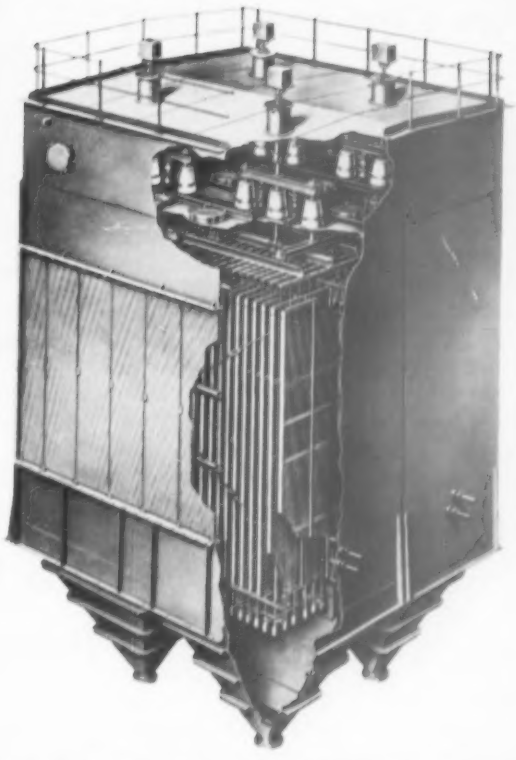
In addition to this installation, Missouri Portland has ordered three more Research-Cottrell precipitators. One, installed early this year, cleans the gases from Prospect Hill's 12′ x 450′ wet process kiln.

Two other units have been ordered for two dry process kilns at the Sugar Creek Plant, Kansas City, Mo. M. I. Rappers will be included on all these installations.

For a detailed description of Research-Cottrell precipitators and their applications in the cement industry, write for Bulletin GB.

RC 160

At Left:
Shows Research-Cottrell precipitator, connecting flues and stack. Cement block building in foreground at right is substation which contains two half-wave rectifier sets and M. I. Rapper control equipment.



At Right:
Cutaway drawing of the Research-Cottrell expanded metal plate precipitator installed at Prospect Hill Plant of Missouri Portland Cement Co.

Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, New Jersey • 405 Lexington Ave., New York 17, N. Y.
Grant Building, Pittsburgh 19, Penna., 228 No. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

About the Author . . .

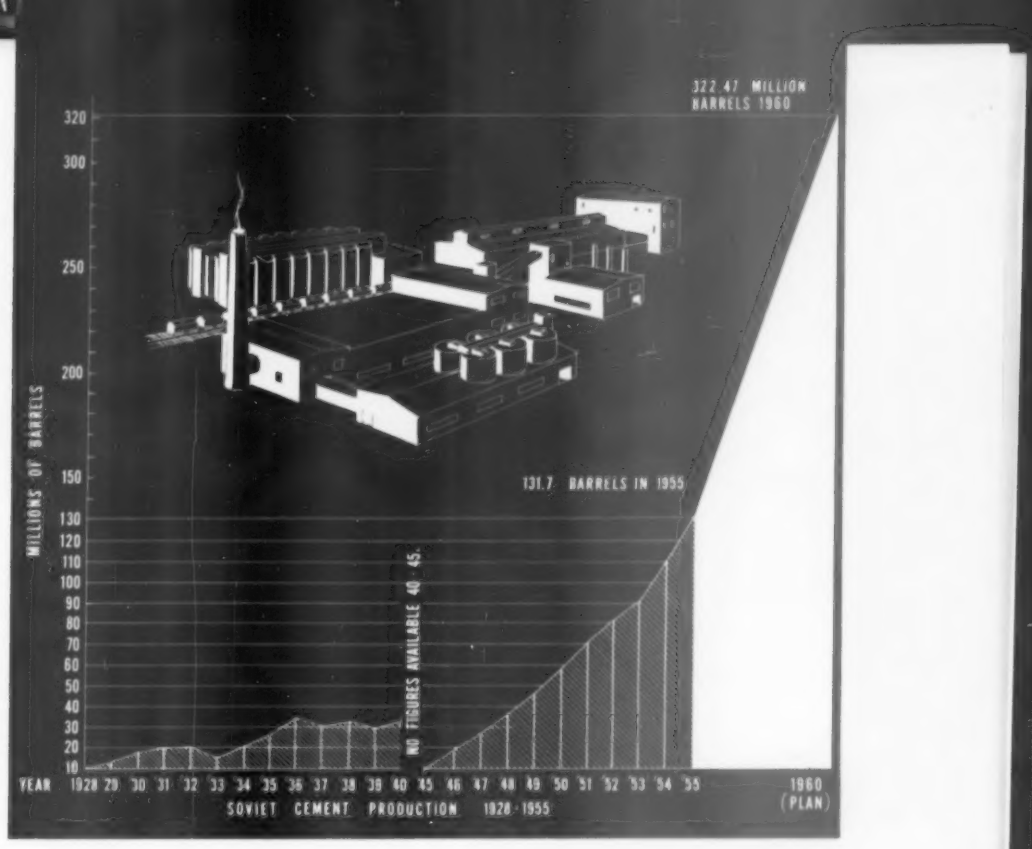
The author, V. Katkoff, is well qualified to speak authoritatively on the Russian cement industry. M. Katkoff—who holds B.S. and M.S. degrees from the University of California and a Ph.D. from Ohio State—has worked in fields connected directly with the Soviet economy since 1940, including research projects for the federal government the past four years.

Here's the Inside Story On How the

Russians Have Their Cement

In the Past Five Years and Plan to Boost It in the Next Five

By V. KATKOFF


322.47 MILLION BARRELS 1960
131.7 BARRELS IN 1955
MILLIONS OF BARRELS
NO FIGURES AVAILABLE 40 45
YEAR
1928 29 30 31 32 33 34 35 36 37 38 39 40 45 46 47 48 49 50 51 52 53 54 55
1960 (PLAN)
SOVIET CEMENT PRODUCTION 1928-1955

Doubled Output

THE RUSSIANS are suddenly making some spectacular headway in the world race to increase cement production—with a considerable expansion of cement capacity since 1950 and faster growth in the immediate offing. Russia's cement production, which has more than doubled in the past five years, is scheduled for an even greater boost in the Soviet government's new (1956-60) Five Year Plan. Russian Premier Bulganin told the Twentieth Party Congress that the eastern areas of the U.S.S.R. alone should be producing more cement by 1960 than the entire Soviet Union manufactured in 1954.

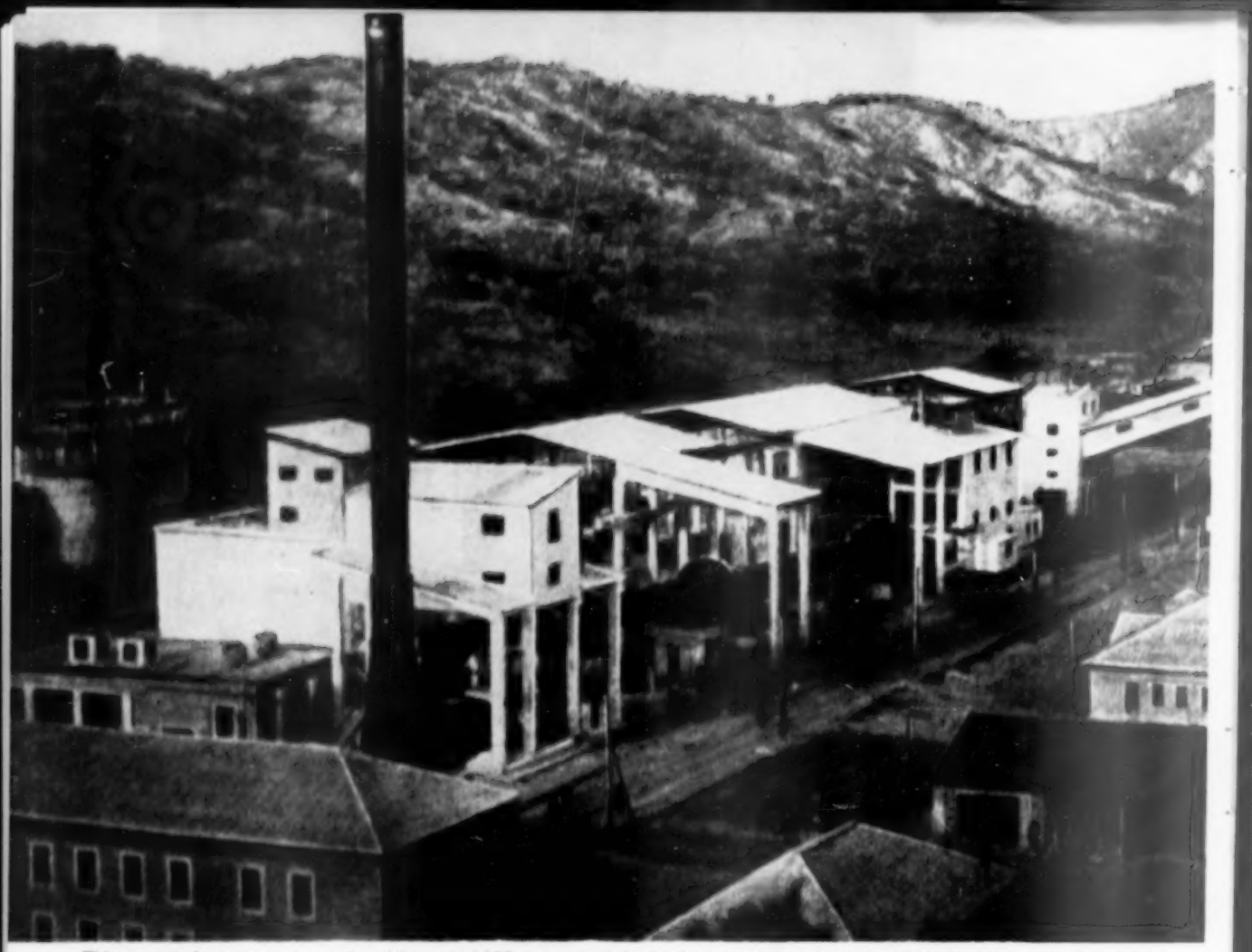
Directives for the sixth Five Year Plan state that during this upcoming period, the Soviet cement industry will introduce expensive automation of technological production processes and provide more efficient organization of work and utilization of existing facilities. By these means, the Soviets claim that in 1956 alone, they can produce an additional 1.5 million metric tons* (about 8.7 million bbl.) of cement.

Greatest share of the total output will be used in the eastern parts of the country. For example, the Krasnoyarsk hydroelectric plant will require some 7 million cu. meters of concrete and ferroconcrete. Eight concrete plants at the site of construction will supply 15,000 to 20,000 cu. meters of concrete per day.

The planned industrial expansion in the eastern region will, to large degree, depend on the availability of cement and its products. The gigantic task set in the field of construction by the Twentieth Party Congress cannot be fulfilled without an ample supply of cement. The production index of the Soviet cement industry should be a good indicator of the success or failure of the expansion of new eastern industrial bases.

Raw materials for the cement industry are plentiful in central Russia and in Siberia. The

*One metric ton is equivalent to 2,204.622 lb. One bbl. of portland cement weighs 376 lb. Thus one metric ton equals 5.863 bbl.



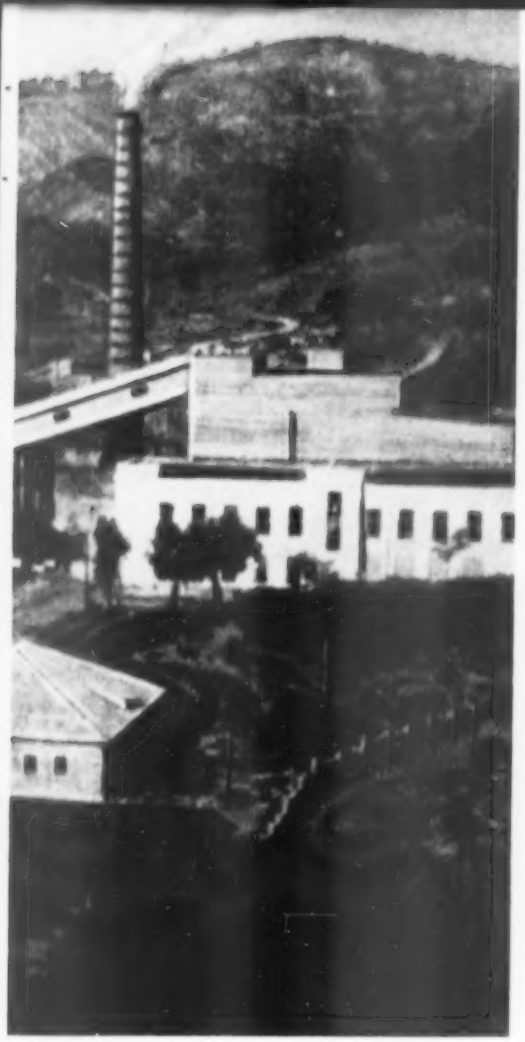
This cement plant was constructed in Albania in 1955. It was built by the Soviets, using equipment made in the Urals

problem lies not so much in getting raw materials, but in the organization of productive facilities and the labor supply in areas where these materials are scarce. That the Soviets anticipate shortages of cement during the next five years is indicated by the recent trade agreement with Yugoslavia for importing cement from that country.

The Soviet cement industry is a state monoply. All plans for production and consumption are determined by the government and announced in either the Five-Year or annual plans. Any adjustment in the capacity of existing plants is closely supervised by the state through such agencies as the State Planning Commission and the State Bank.

Most of the cement produced in the Soviet Union is consumed by the state. Private consumption is geared to supply the collective farms for their normal building and repair activities. Private home owners have the least opportunity to buy cement. In 1954 it was expected that 10½ million bbl. (or about 10 percent of total output) would be allocated to non-state use. With the recent private home building progam being encouraged by the Soviet government, this private market channel cannot be diverted to state construction programs. In fact, with the population moving to the East, there should be greater demand for construction of homes, schools, and offices.

The Soviets inherited an inadequate, but well centralized cement industry located principally in the Central regions of the Ukraine, the North Caucasus, and the Volga river area—where in 1937 about 73 percent of the total Soviet cement was produced. In these regions there is an ample supply of raw materials and an availability of cheap transportation. The central regions have a



well developed net of railroads and highways; the Donets Basin in the Ukraine is near water transportation; Novorossiysk in the Northern Caucasus is located on the Black Sea; and the Volsk cement center is right on the Volga river. The other regions—the European North, Siberia, and Central Asia, for example—did not produce their own cement in sufficient amounts and were forced to depend on import from the surplus cement areas.

When industrialization was expanded, cement became scarce. So the Soviets began in the early 30's to build new cement plants in regions with an acute demand for cement. Thus the Soviets encouraged decentralization of cement production centers, lowered the cost of transportation, and created rough regional self-sufficiency. The third Five Year Plan (1938-1942) called for an additional increase of 28 million bbl. of cement, all to be produced by new plants outside the Ukraine. These new plants were designed for productive capacities ranging from 175,000 to 600,000 bbl. annually. At the same time it was stated that at the end of the second Five Year Plan (1937), the Ukrainian cement output was to be stabilized at about 21-22 percent of the total Soviet cement output.

Mechanization of the Soviet cement industry was a slow process. In 1933 the entire cement industry used 14 excavators; in 1935, but 27. In 1937 the industry employed 53 excavators and by 1938 the number had increased to 83. Other mechanized and modernized equipment was increased in even smaller volume. Nevertheless, because of these additional investments, the Soviets realized an increase in labor efficiency by 81.5 percent between 1932 and 1937. Available data for the 1929-1938 period show that there was a close correlation between a share of additional investment in new equipment and total output.

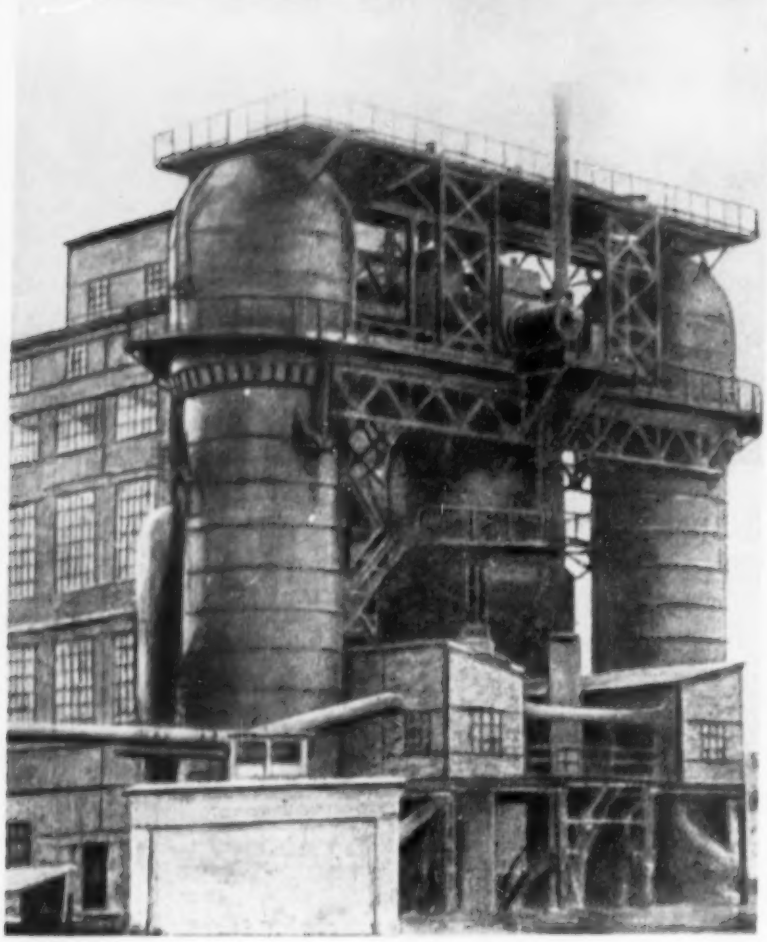
Year	Cost of Equipment per worker		Production	
	Rubles	Percent of 1929	1000 metric tons	Percent of 1929
1929	5,367	100.0	2232	100.0
1932	7,541	140.5	3478	155.8
1933			2709	125.8
1937	13,656	254.4	5454	244.4
1938	—	—	5688	254.8

This table suggests that prior to 1938 the Soviet cement industry suffered from a scarcity of mechanized equipment rather than from shortages of raw material and labor force. Prewar total labor force in the Soviet cement industry was remarkably stable as shown below:

Year	Number of Workers
1933, January	29,700
1934, January	26,300
1935, January	27,000
1936, January	29,500
1937, Average	28,091
1938, September	27,545

The total number of workers fluctuated 13 percent between 1933 and 1938, whereas the actual output of cement more than doubled. Between 1936 and 1938 the average output per worker was stabilized at more than 1000 bbl. annually. By 1938, the industry was more mechanized and the question of seasonality was improved. This is supported by the fact that even plants located where deep snow at times obstructed transportation increased their output. In addition many large plants shifted from seasonal to permanent employment of workers.

Within a few months after the Germans attacked the Soviet Union in June, 1941, Germany occupied an area where approximately 50 percent of the total Soviet cement industry was located. It is reasonable to assume that to overcome such a drastic reduction in output, the Soviets expanded their cement production in areas which previously did not produce it in large amounts. In the occupied areas some cement works were destroyed or damaged during the German advance and retreat. Available information indicates that the total de-



Experiment in cement manufacturing equipment

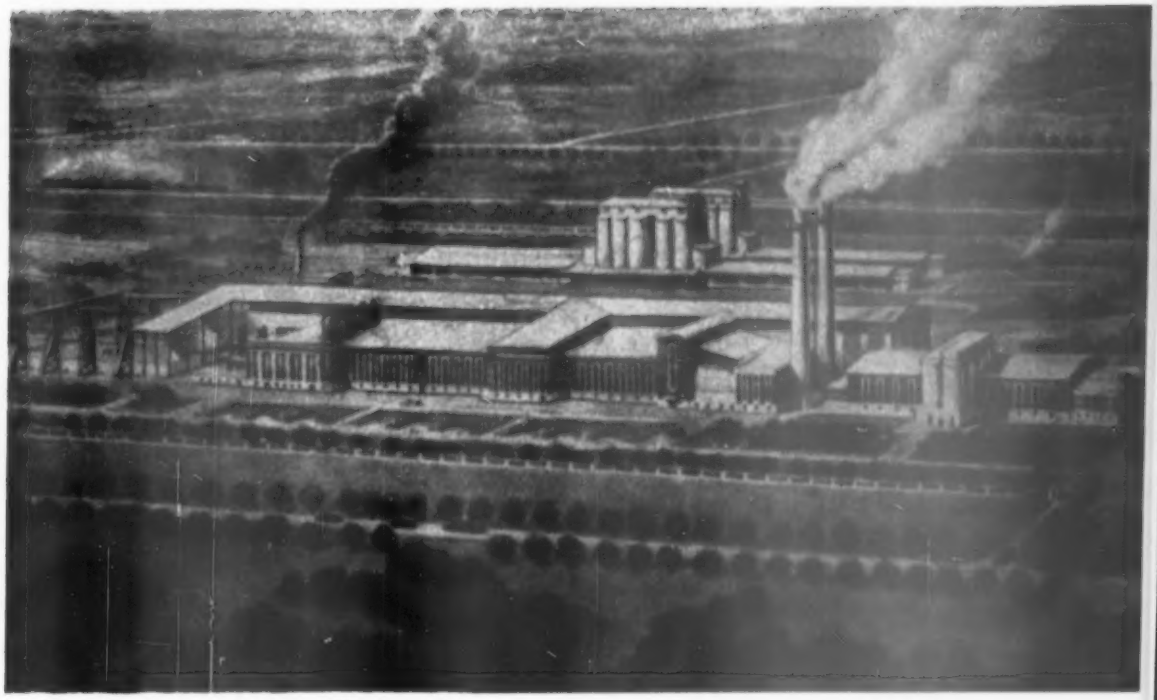
struction of the Ukrainian cement works may be estimated at 67.2 percent of total prewar production.

Since building materials were urgently needed for the reconstruction of destroyed cities, power plants, dams, bridges, and other enterprises, immediately after the liberation of occupied areas, the Soviets turned their attention to the cement industry. Some cement plants were rebuilt on the same location; other small-scale plants were abandoned. As a whole, the Soviet cement output during and after the war was drastically reduced through destruction of the existing facilities in the occupied areas, bombings of plants located in the war zone, and reduction in production in the unoccupied areas.

Between 1936 and 1940 the Soviet cement output was stabilized at 32 million bbl. annually. At the end of World War II, the Soviets were producing but 32. 9 percent of their prewar volume. Postwar recovery and expansion, however, were remarkably rapid. The postwar Five-Year Plan (1946-1950) called for the construction of new cement plants in the North, Northwest, Central regions, Volga river valley, Southwest, Urals, and Siberia. This plan emphasized the reconstruction and rehabilitation of the cement industry to prewar level, but actually the 1950 production was almost twice the 1940 level.

The fifth Five Year Plan (1951-1955) anticipated an increase of 2.2 times over that of 1950. If the 1951-1955 plan had been accomplished, then the total output would have been around 133 million bbl. instead of actual 130 million bbl. But the difference between planned and actual output was indeed slight. Apparently by 1955, the Soviets not only restored but expanded prewar production in all old cement plants which were destroyed. In addition, the plants which were established during and after the war were going strong in 1955. Also important contributors are those cement plants (not included in the prewar statistics) which were taken over by the Soviets with the occupation of the Baltic republics, Western Ukraine, and the western parts of White Russia in 1940.

There are no complete statistics on production of cement by individual regions or even republics.



Architect's drawing for a new large-scale cement plant

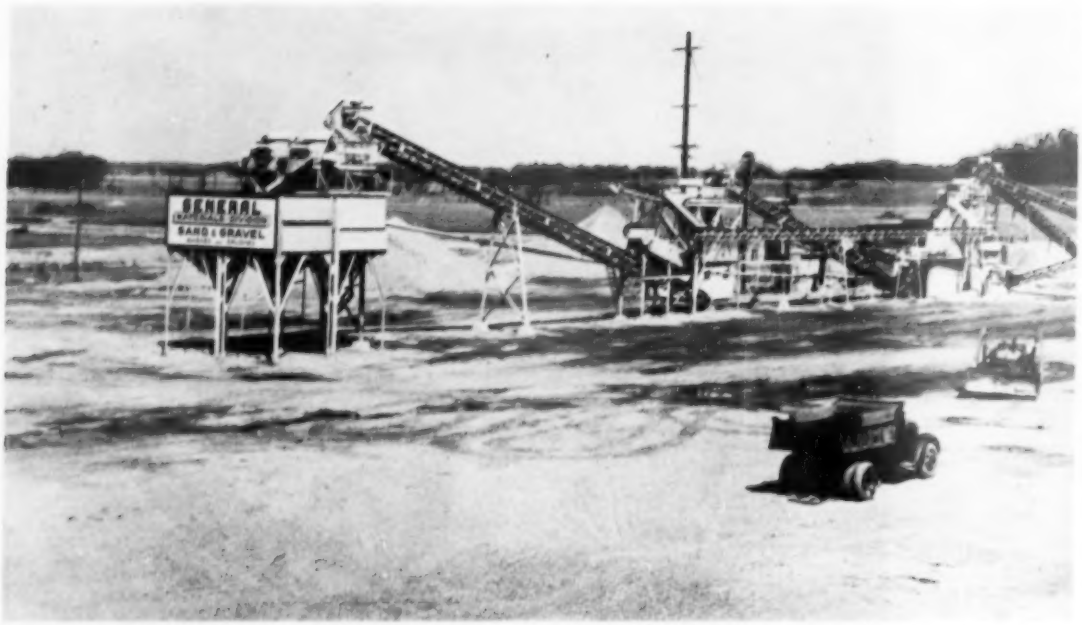
Cement is being produced by major enterprises under jurisdiction of the U.S.S.R. Ministry for Construction Materials, but individual regions and some republics have the right to, and often do, organize their own small scale production of cement which is not included in the All-Union statistics. In addition, small cooperative organizations also are permitted to produce small amounts of cement for local markets. However, these secondary sources are of a temporary nature and produce only small volumes. They are usually set up for a specific purpose such as building a bridge, a local school, or some other similar project.

When official plans for production of cement are announced by the government, some republics are directed to increase their output at a greater rate than others. A republic which fails to increase its cement output for the first two or three years of a five year plan suddenly gets heavy pressure from Moscow—and jumps its output by allocating an extra amount of labor force, equipment, and transportation facilities to fulfill the required quota in production.

Between 1950 and 1955 the Soviets more than doubled their cement output, and although little is known on the construction of new plants during this period, it is reasonable to assume that with a large number of dams and housing projects being constructed, the Soviets must have intensified utilization of the existing facilities and constructed new cement works. The Russians have set their 1960 cement production goal at 320 million bbl.—and if growth continues at its present pace, they're likely to make it. This would represent an almost incredible increase in production of more than 30 times over the first postwar year of 1945.

Cement and prefabricated reinforced concrete represent the foundation of most Soviet construction programs. During the 1955-1960 period not less than 82 enterprises are to be constructed in one area of the Soviet Union for production of reinforced concrete parts and units. This area has a large industrial expansion underway, plus the so-called "Main Turkmen Canal"—683 mi. long and requiring a great deal of cement for the dams, bedding and other structures.

To provide various new construction projects with an ample supply of cement, the Soviets are currently building numerous cement works. Whether the Soviet cement industry will be able to produce enough for its vast need should be found in the reports of the Soviets' industrial and construction achievements in the East within the next few years.



Overall view of sand and gravel plant designed for straight line production with ample storage and loading out facilities to take care of all demands

It's First 12 Months Show

New York Coal Co.'s Is Flexible, Compact,

THE FIRST 12 MONTHS OF OPERATION at New York Coal Co.'s* sand and gravel plant near Springfield, Ohio have proved the plant's ability to produce specification materials. The plant is highly flexible, compact and well designed, and produces 300 t.p.h. of several sizes of washed sand and gravel (including 40 percent and 100 percent crushed) and unwashed road gravel.

The open, straight-line type plant was begun in October 1955 at a new pit 6½ miles southeast of Springfield. It is operated under the Columbus, Ohio firm's General Materials Division.

Plant design incorporates three screening stations. The primary station in particular is very compact and of unusual design, wherein the pit-run material is simultaneously scalped and de-sanded on a 4- x 12-ft. triple-deck wet screen and the resulting products distributed as many as five different ways. For example, oversize gravel either can be belt-conveyed to a surge pile or fed to either of two crushers (a 3-ft. gyratory or a

*See ROCK PRODUCTS, February, 1953, p. 74, for a complete description of the company's multiple operations.

By KENNETH A. GUTSCHICK

Gravel Plant Well-Designed

20- x 20-in. impact breaker); products off the middle and bottom decks either can be fed to the impact breaker or go direct to the secondary screening station; and the sand fraction drops to a three-cell water scalping sand tank, then to a single screw classifier-dewaterer, before being stockpiled by belt conveyor.

The secondary station consists of a 4- x 12-ft. double-deck scalping screen (which is closed-circuited by belt conveyor to the gyratory crusher) and a single screw coarse material washer. The latter is bypassed in the production of road base material. Final sizing is made on a pair of 4- x 12-ft. triple-deck wet screens which are mounted over a battery of four 100-ton truck bins.

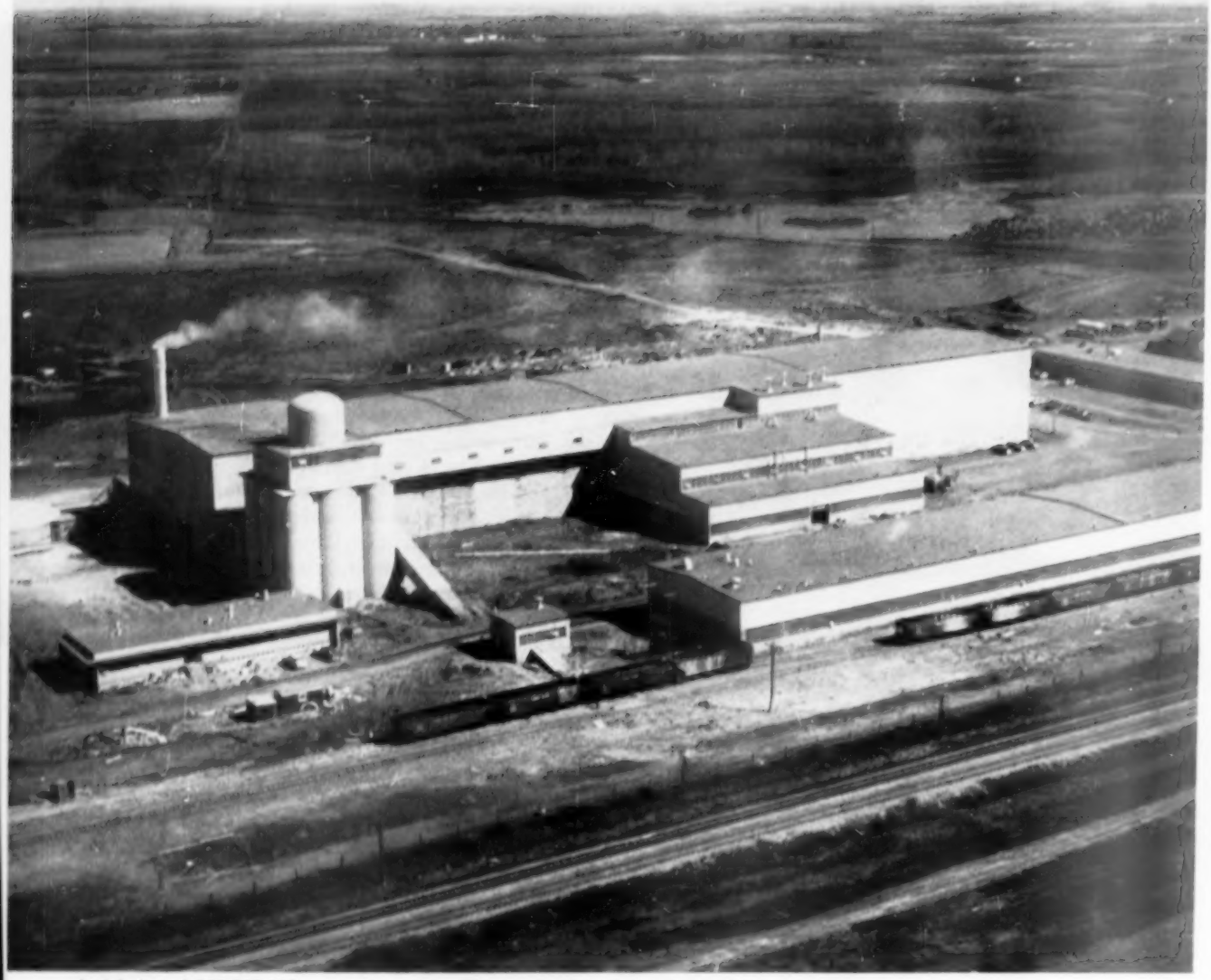
Intra-plant transportation is handled exclusively by belt conveyors, which are carried on tubular steel framework and supports. The plant was designed by Paul E. Ryan, in charge of operations, and Robt. M. Patton, president, New York Coal Co., and The Columbus Conveyor Co., Columbus, Ohio; it was erected in less than four months by company personnel under the direction of Mr. Ryan.

Other important features of the new operation include use of a portable grizzly dragline hopper which provides a surge supply of 37 tons, a 100-ton all-concrete primary hopper for receiving pit-run material, the 820-ton surge pile (already mentioned) for storage of oversize gravel or gyratory crusher-run material (which is returned to the primary screen by belt conveyor), centralized electrical controls, and low manpower requirements.

The deposit, which runs 70 percent gravel-30 percent sand, is 39 ft. thick and is overlain by 0-4 ft. of overburden; it is being worked by the cut-and-fill method. A Northwest 95D diesel dragline, with a 70-ft. boom and carrying a 3-cu. yd. Hendrix perforated bucket, is used in both stripping and gravel excavation. The machine loads to the 37-ton-field grizzly hopper, with plus 12-in. boulders being rejected. The hopper, mounted on steel skids, is moved by a bulldozer, and is emptied through two clamshell gates. A Euclid tractor-bottom dump wagon delivers 25-ton loads to the plant.

The truck hopper, built of 12-in. reinforced concrete, measures 12- x 20-ft. and is 10-ft. deep. It is fitted with a grizzly with 12-in. square openings and holds 100 tons of material; it discharges through a single opening to a Syntron F-45 vibrating feeder which feeds the 30-in. primary conveyor, 130-ft. centers. Use of concrete in this installation has proved very successful; there is practically no abrasion since the pit-run gravel

(Please turn to page 90)



Aerial view of 900,000-bbl. wet process plant (Photo oriented with layout drawing in story)

In Edmonton, Alberta

Vision and A Big

Leads to construction of Second kiln will

Oil Boom

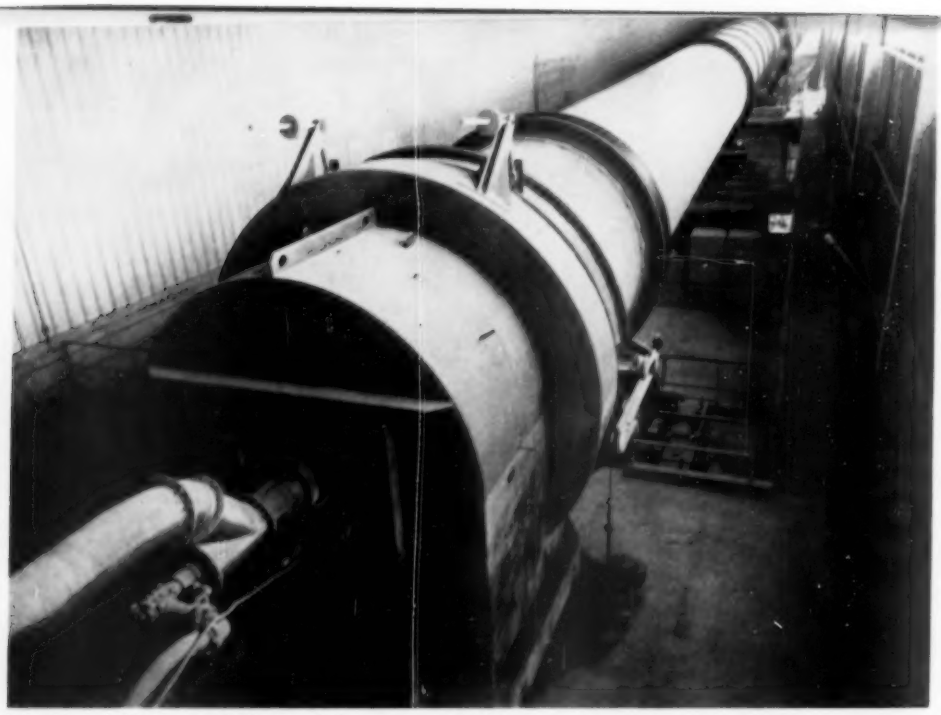
900,000-bbl. plant double capacity

By KENNETH A. GUTSCHICK

A BIG OIL BOOM, rapid growth in population, and a keen eye for future business possibilities prompted the building of a new cement plant in Edmonton, Alta—Canada's oil capital and fastest growing city. Inland Cement Co., Ltd., foreseeing the growing need for cement in Edmonton —where population and industry have doubled since 1947—started the first kiln at its 900,000-bbl. wet-process plant in March this year. Since Inland pegged the annual demand for cement in the area at 2,000,000 bbl. (15 percent of which will be oil-well cements), a second kiln is being installed to double the new plant's capacity. When completed this December, the building program will represent a capital investment of $12,500,000.

Financial backing for the company was provided by both Canadian and Belgian interests. The latter is represented principally by Societe Generale de Belgique, which also has financial interests in various cement concerns in western Europe. One of these—Cimenteries & Briqueteries Reunies, S. A., Brussels, Belgium—is serving as consulting engineers on design and construction. Canadian interests in the Edmonton enterprise are represented by Sogemines, Ltd. of Montreal, which also participates in financing mining projects in Canada. The Inland firm, headquartered in Edmonton, was incorporated in July, 1954, and plant construction was started in May, 1955, with cement produced less than a year later.

The plant is located along the main line of the Canadian National Railway 1½ miles northwest of the city limits. Edmonton in general—this site in particular—was chosen due to proximity to rapidly expanding markets, excellent raw materials and transportation facilities, and low-cost natural gas supply. Principal raw materials are high-calcium limestone and clay, with lesser amounts of sand and iron oxide additive being required. The two latter materials are trucked in from local sources, while clay is dug at the plant site. Limestone is shipped in by rail (one-line haul) from a company quarry at Cadomin, 180 miles to the west. Natural gas supplies in the area are virtually



The 11- x 340-ft. gas-fired rotary kiln produces 2850 bbl. per day. A second identical kiln is being installed to the right of the kiln building

unlimited, coming from several major oil and gas fields developed near Edmonton.

Regarding the market aspect, during the past ten years, Edmonton has changed from a small agricultural and distribution center to an area of manufacturing importance. Directly responsible for this development was the discovery of oil in 1947 (the area now accounts for 85 percent of Canada's oil and gas production), followed by the influx of basic petrochemical industries and later many secondary industries. Since 1947 population has nearly doubled, growing to 223,000 this year. By 1959, it is expected to reach 300,000, thus giving indication of continuously expanding markets for cement. Edmonton is also referred to as the gateway to the north, serving the numerous uranium and gold mining towns located in northern Alberta, Saskatchewan, and the Northwest Territory. Cement shipments are made to these areas by a combination of rail- and barge-haulage, or by airplane.

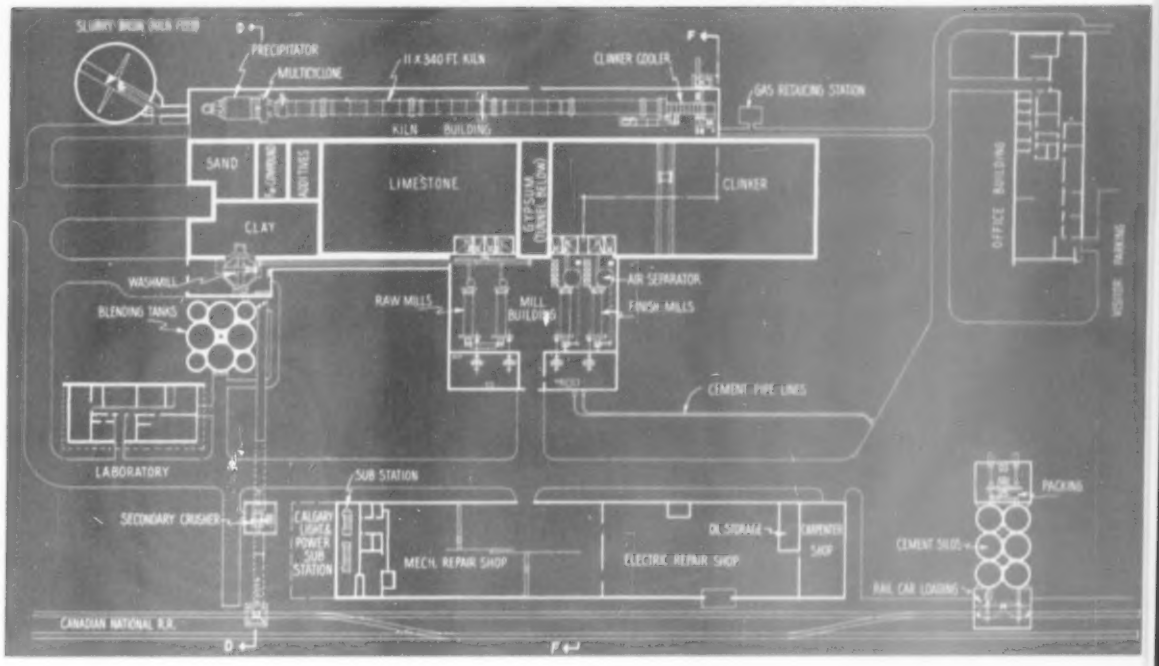
The Inland plant is characterized by a simplified flowsheet with relatively few production units required, as well as by a compact layout (as shown in the accompanying layout drawing). The covered storage area, used for all raw materials and cement clinker, is centrally located, with the kiln building and slurry basin attached on one side, and the blending tanks and mill building on the opposite side. The cement silos and packing station are off to one corner of the property, so that truck traffic will not interfere with manufacturing operations.

Raw grinding is handled in open circuit by two 8- x 37-ft. two-compartment mills, with a 26-ft. wash mill preparing the clay slip and ferrous compound. Two identical compartment mills are used in finish grinding; these are operated in closed circuit with 16-ft. air separators. The kiln is a 11- x 340-ft. gas-fired unit which discharges clinker to a 6- x 33-ft. grate-type cooler and is exhausted through multicyclones and an electrical precipitator in series.

Among the features of this ultramodern plant are the following: elaborate control panels for operation of the kiln and grinding mills (including panel board in mill building showing position of cement pipe valves at top of silos); flexibility of slurry handling and blending; excellent dust collection (more than $500,000 invested in dust-collection equipment); safety lockout system for electrical precipitator; modern packing station for rapid loading of cement (bag or bulk) to rail or truck; elimination of clinker crusher (and screens) by installation of bar grizzly at discharge end of cooler; large, well-equipped machine shop and laboratory; and tunnel access (below gypsum bin) between mill and kiln departments.

Because of the area's sub-polar climate (the plant is actually the northern-most cement plant in North America), all plant units are completely enclosed and auxiliary heating is required during winter months to permit year-round operation. Winter temperatures are generally below zero, for weeks at a time, and often the temperature is lower than -40 deg. F. Conversely, summers are warm,

Layout of new cement plant



requiring adequate ventilation throughout the plant. Most buildings are enclosed with corrugated asbestos-cement siding, and all slurry and water lines are insulated.

A typical mix in manufacturing standard portland cement at Inland consists of 68 percent limestone, 27 percent clay, 3 percent sand, and 2 percent ferrous compound. For the latter, the company obtains leach tailings from the nickel refining operation of Sherritt Gordon Ltd., which is located at Fort Saskatchewan, 20 miles from Edmonton; the iron oxide content of this material is 70 percent.

Clay is excavated from a glacial deposit at the plant site by a Bucyrus-Erie 38B dragline, carrying a 1½-cu. yd. Page bucket. The deposit exceeds 50 ft. in thickness, but is only being excavated to 25 ft. Plans call for using the clay pit as a source of process and cooling water in future plant operation. Haulage to the plant (¼ mile) is handled by two Mack 10-ton trucks, equipped with heated bodies to prevent freeze-ups. The trucks also have tandem axles to negotiate the clay terrain. Clay, as well as sand and leach tailings, are trucked to a grabbing pit at the west end of the storage hall, and then transferred to respective bins by an overhead crane. Present clay requirements average 250 t.p.d.

Clay slip and ferrous compound slurry are prepared (alternately) in a 26-ft. Allis-Chalmers wash mill, which has a capacity of 25 t.p.h. of dry material (or 50 t.p.h. of slurry). The wash mill is driven at 13 r.p.m. by a 100-hp. motor through a Falk reducer; the wash mill tank, made of reinforced concrete, is lined with granite block to protect the concrete from abrasion. A 4-in. Wilfley slurry pump (one standby) transfers the wash mill product to the blending tanks, and a third 4-in. pump is available to deliver the slurry to the raw mills if additional grinding is required.

The limestone quarry near Cadomin is situated along an existing railroad, in the foothills east of the Canadian Rockies. The deposit is extensive, being part of an upthrus' block which rises almost abruptly 1000 ft. above the primary crusher and loading station. The limestone beds, which have a stratigraphic thickness of over 500 ft., dip 32-35 deg. south and strike east-west. The limestone, of Devonian age, is the high-calcium type, containing less than 2.5 percent insolubles and about 2.7 percent MgO.

(Please turn to page 94)

You Can Improve

Modern rotary lime kiln installation

Rotary

By Taking

Conditions and

WHEN USING A ROTARY KILN FOR PRODUCING LIME, the question of how much it should make is not always answered properly. "Capacity" is often listed as the output limit of the kiln, the figure being derived from the manufacturers' design data.

The rotary kiln is said to be the largest single piece of moving equipment in industry. It may represent a total weight of 700 to 1000 tons—or maybe more—is carefully constructed and runs easily on carrying rolls. Alignment of the kiln is precise, so that it swings freely when being brought to a stop.

Quite often, plant operating officials can improve on the kiln "capacity" figure by taking advantage of local conditions and better technique. The following figures are typical of this trend:

Kiln—10- x 8- x 300-ft.
Capacity—200 t.p.d.
Production attained—300+ t.p.d.

This attained production is an average and includes many days when rates up to 340 or 350 t.p.d. were reached. The capacity figure represents the maximum that some operators thought was its limit.

To burn coal, an adequate mill for grinding and an adequate draft fan for air are needed. A deficiency at either end of the kiln becomes a limiting factor. This ability to burn fuel to do useful work is a measure of the degree of output that can be attained in any one kiln. Actual figures from operating kilns are listed in Table 1. A good way to show the amount of fuel burned is in terms of B.t.u. released per cubic foot of kiln volume, calculated on the volume inside the lining.

Table 1: Heat Release Per Unit Volume

(Inside Lining)
B.t.u. per cubic foot per hour

Kiln A — 6370
Kiln B — 5430
Kiln C — 5430

Each kiln in Table 1 had some limiting factor that prevented further increase, namely:

A—Unit pulverizer and draft fan at limit.
B—Draft fan limit.
C—Draft fan limit.

Lime Kiln "Capacity"

Advantage of Local Improved Technique

By J. R. TONRY*

Other factors that may limit kiln output are feeder, drive, cooler capacity and general condition of equipment. By limit is meant, for example, that a pulverizer is grinding at its maximum motor power to a fineness as low as can be tolerated for proper combustion. This can be affected by grindability and moisture content of the coal. When maximum power is being used by the drive motor, it may be helpful to use a larger motor. Quite often, use of a larger motor will increase the kiln output through the use of additional fuel.

The term "capacity", when applied to kiln production, is not always clearly understood. The manufacturer sets some calculated standard that serves as a starting point. After the initial rating has been met, the way is then clear for improvement. Some optimum figure may be set as a standard if the kiln and equipment are evaluated carefully. Of course, any standard is subject to revision as production improves through increased "know-how" and better general operating technique.

Procedure in evaluating an installation would include:

(1) Equipment survey
(2) Fuel survey
(3) Product desired
(4) Operating procedures

Further break-down of these various phases of study is needed to develop the proper information. Each is considered separately here.

(1) EQUIPMENT SURVEY

Draft fan. Does the fan have reserve capacity, or is it working at its limit? This will be influenced by friction losses in the system caused by ducts, dust chambers, dust collectors, etc.

Perhaps the exit gas ducts are needlessly long, too small in size, too many baffles or too much needless restriction in a gas chamber. The stack handling the gases may be too small.

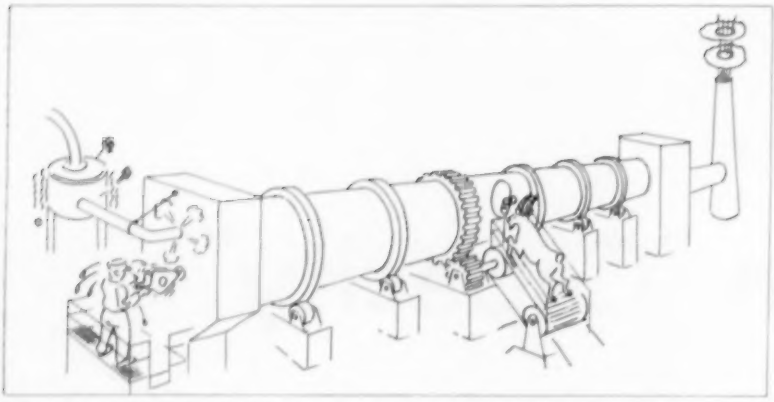
An important consideration is temperature of the exit from the fan. Safe limits must be observed to avoid destruction of the fan.

Feeder. Are the feeding device and material handling equipment working at capacity, or is some flexibility still present? Can material handling be simplified? This is one of the best places to save installed horse power through careful arrangement.

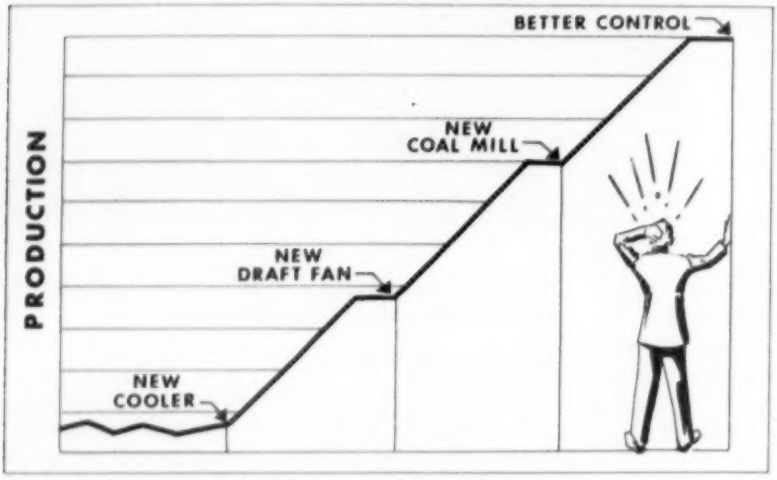
Kiln. Is the kiln properly aligned and are the tires and rolls in good condition? The shell should be checked for cracks, distortions and worn spots. The seal ring must be checked for condition. Other items for consideration are size of feed end restriction, condition of lifters in feed end, feed pipe, lining, nose ring and any special equipment of the recuperator type.

(Please turn to page 86)

*Northbrook, Illinois



Kilns like this operator's "nightmare" may not be operated, but far too many are too obsolescent for efficient operation



Steps in kiln improvement that will increase capacity rating

Kiln drive. The motor capacity must be checked, because it may be at its limit. The speed reducer and other drive equipment also should be checked. Clearances of the girth gear and driving pinion are critical. The condition of the base mounting may be critical due to inadequacy or deterioration.

Kiln hood. Perhaps it fits too poorly around the nose of the kiln or has too many or too few openings.

Cooler. This item means much in total production and fuel economy. Does it have sufficient capacity, or is it overloaded? Is cooling effective, and is hot air returned to the kiln? An inadequate cooler can present an insurmountable obstacle to improved operation.

Firing equipment. Can more fuel be supplied to the kiln at satisfactory temperature and fineness, or is equipment at its limit?

Material handling. This equipment is essential for production, and its condition and arrangement mean much in obtaining satisfactory operation.

Storage and processing facilities. Sizing equipment permits supply of material to suit customers' needs, and adequate capacity means attainment of desired product and satisfactory operation.

In general, equipment must be in good condition to eliminate stops in production due to breakdowns. It must not be working under overload. Machines producing at peak loads within mechanical limits of structure can do satisfactory work, but excesses result in failures of parts and lost production. As an illustration, a 100-hp. motor may be used to drive a 60-hp. speed reducer; a 30-hp. speed reducer may be taking full load at a lower output speed than it was rated for.

(2) FUEL SURVEY

When coal is used, a choice must be made according to quality of product desired. Variations in coal are by general types and by the specific qualities of the various beds—such as moisture, ash, and ash softening temperature. The most easily available fuel may or may not produce the quality desired in the product.

When gas is used, variations in heating value can make correlation of fuel efficiency difficult. This may take place when two or more fields are available as sources of gas coming through the lines to the plant.

(3) PRODUCT DESIRED

Product is a most important consideration, because it must do the job desired by the consumer. Variations in degree of burning, reactivity, color and size must be considered.

(4) OPERATING PROCEDURES

These include the "know-how" to use the equipment to best advantage and in such a manner as to make the operation profitable.

After such an evaluation has been made, corrective steps may be outlined as required. These could mean new and larger equipment of the same kind, a change in equipment from one type to another, or maybe remedial action to restore equipment, such as repairs or relining. Operation procedures may need improvement or revision. These objectives may be difficult to reach, but generally the ultimate effect is better operation. A kiln that is hampered by breakdowns of equipment, lining failures, etc., will be a better machine when it is properly restored or maintained in an orderly manner.

The above discussion is related to production and "capacity". If a 300-ft. kiln with 18,000 cu. ft. of volume can produce 300-plus tons of lime per day in one plant, it should produce the same amount in other plants. That it may not is due to some characteristic of the raw material in its behavior in handling or burning. For example, a limestone that disintegrates appreciably on heating would not favor high production rates.

Here are typical examples to show how operation can be improved. A kiln producing at the rate of 240 t.p.d. with a fuel usage of 8,000,000-plus B.t.u. per ton was improved to 300 t.p.d. at a fuel usage of 7,000,000 or less B.t.u. per ton with the same

(Continued on page 172)

HOUSE ROLLS are automatically built up with 2 or 3 passes of Stoody 104.

How one of the country's large contracting firms MAINTAINS SHOVEL PARTS

The shovel parts illustrated here are typical of those regularly rebuilt and hard-faced by George M. Brewster and Son, Inc., famous for the big jobs handled, such as the New Jersey Turnpike and approaches to the George Washington Bridge. Standard maintenance practice includes complete restoration of worn house rolls, buckets, bucket teeth, pads and tumblers.

After rebuilding, the Stoody 104 deposit is machined to original size. This is one of the few parts requiring machine work. Others go into service "as-welded."

In the Brewster operation Stoody Hard-Facing Alloys are used for both manual and automatic applications. They help to keep equipment in service longer between repair periods and reduce the number of replacement parts that must be stocked. Life of rebuilt parts is invariably equal to or greater than the original equipment—yet the cost of rebuilding and hard-facing is but a fraction of new part costs.

Procedures followed here and by other major earth-moving contractors are described in detail in the Stoody Hard-Facing Guidebook and other Stoody literature; consult your Stoody dealer (see the "Yellow Pages" of your phone book) or write direct for full information.

WORN SHOVEL PADS. Conventional treatment includes rebuilding worn areas with Stoody Manganese and manually hard-facing with Stoody 1027.

OTHER SHOVEL HARD-FACING APPLICATIONS

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M & M STONE PRODUC

heavy duty crushing equipment

KENNEDY PRODUCTS

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- Swing Jaw Crushers
- Tube Mills
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- Rock Feeders
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- Steam Generators
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Complete Aggregate Processing Plants

General view of M & M STONE CO. at Harleysville, Pa. showing KVS Swing Jaw and Gyratory Crusher, Double Deck Vibrating Screens and Heavy Duty Rock Feeders in operation.

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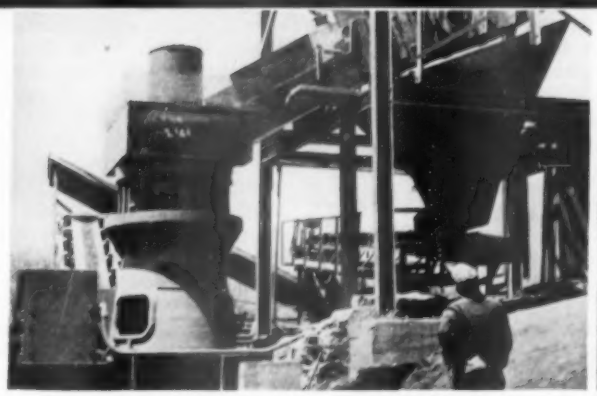
on a basis of proven performance



KVS Gearless Gyratory Crusher No. 38½, Double Deck Vibrating Screens in operation at M & M STONE PLANT.

KVS Heavy Duty Rock Feeder serving KVS Swing Jaw Crusher at M & M STONE CO., Harleysville, Plant.

Send for Bulletin describing KVS Machinery and Equipment.

KENNEDY-VAN SAUN

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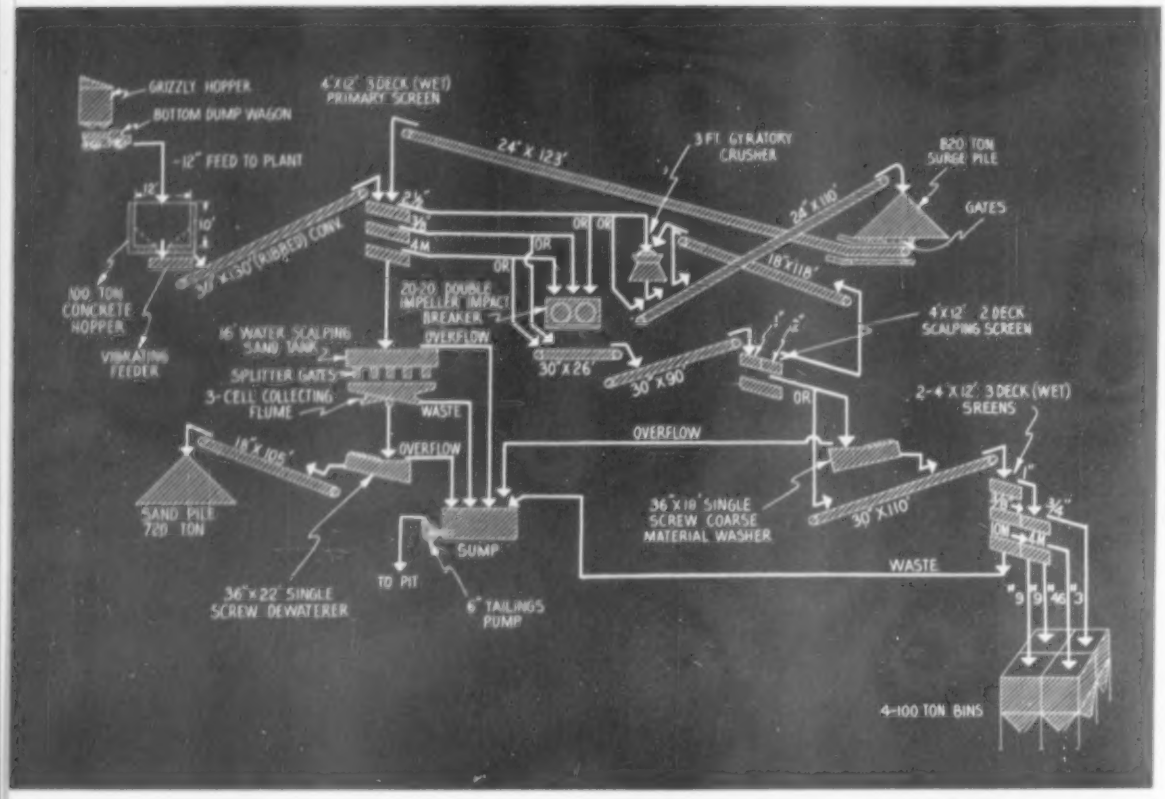
New York Coal Co. Gravel Plant

(Continued from page 79)



Flow diagram of sand and gravel plant

forms its own hopper, with "gravel riding on gravel." The primary conveyor, inclined 18 deg., carries U.S. Rubber Co. ribbed belting, the ribbing serving to dewater and prevent slippage of the material on the belt. The conveyor also has a backstop, and two water spray deflectors at the head pulley for cleaning the belt.

The primary screen, a 4- x 12-ft. Cedarapids unit, has decks with 2½-in., ⅜-in., and 4-mesh openings, respectively. The accompanying flowsheet illustrates the flexibility in handling the four screen products. Normally the oversize goes to the 3-ft. Traylor TY gyratory crusher (100-hp. drive), the middle deck product goes to the 20- x 20-in. Cedarapids double-impeller impact breaker (two 40-hp. motor drives), the bottom deck product bypasses the crusher, dropping to a 30-in. conveyor serving the secondary screening section, and the minus 4-mesh sand flows to the sand settling tank. Options include the following: oversize going either to the impact breaker or to the surge pile (via the 24-in. under gyratory crusher conveyor); the middle-deck product bypassing the impact breaker, thus going direct to the secondary belt conveyor; and the bottom deck product going to the impact breaker. In the production of road base material, the sand tank is bypassed, thereby leaving the fines in the product. In the production of 100 percent crushed gravel, both crushers are necessarily used; otherwise the gyratory crusher is used only part-time. Gravel from the surge pile is reclaimed through three clamshell gates onto a 24-in. tunnel belt conveyor and returned to the primary screen. The stone in the surge pile is relatively free-flowing.

The sand settling tank is a 16-ft. single-type three-cell Eagle Iron Works unit with five power-operated bleeder valves. The tank serves to get rid of excess water, but at the same time minimizing the loss of fine sand particles; it also makes a rough classification of the several sizes, based on the gravitational settling of the coarse particles near the intake end and the finer particles towards the opposite end. In actual operation, sand is discharged automatically through each valve** to three splitter gates, each gate in turn serving one of three parallel collecting-blending flumes. Splitter gate openings are varied accordingly to the gradation desired. Presently, only one size of sand is produced at a time at the Springfield plant, with only two of the flumes being used. One flume collects the unwanted sizes and discharges them to a waste sump; the other serves a 36-in. x 22-ft. Eagle single screw dewaterer, which in turn discharges concrete sand or masons sand (whichever is being produced) to a stationary 18-in. stockpiling belt conveyor. In the future the company plans to install a second stockpiling conveyor, so that separate sand piles can be maintained without the use of a yard crane or bulldozer.

At the secondary station the gravel is scalped on a 4- x 12-ft. Cedarapids

(Please turn to page 92)

**The power valve assembly consists of a vertical shaft with a rotating paddle at the bottom. When the sand builds up to restrict paddle rotation, a mechanism is actuated which releases the valve, thereby draining the sand. When sufficient sand is bled out to free the paddle, the gate automatically closes.

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New York Coal Co. Gravel Plant

. . . Continued

Left: Primary station, where scalping-desanding screen splits load to surge pile (left), two crushers, and sand tank (right)

Below, left: Secondary screening station, consisting of scalping screen and single screw coarse material washer. Horizontal conveyor returns oversize to 3-ft. gyratory crusher

double-deck screen, with the oversize returning to the gyratory crusher by an 18-in. conveyor (or it can bypass the crusher and go to the surge pile). The screen product drops to a 36-in. x 18-ft. Eagle Iron Works single screw coarse material washer-dewaterer, from which it is carried by a 30-in. conveyor to the final screening station. The screw washer is equipped with a trash remover tub end, incorporating three sets of paddles. With this innovation, vegetation, wood chips, etc., float and and roll up an inclined spout to waste. The unit is driven at 32 r.p.m. by a 30-hp. motor; in the production of road gravel it is bypassed.

Final screening and washing is handled on two 4- x 12-ft. Cedarapids triple-deck wet screens mounted over four 100-ton steel bins. The flow sheet indicates one of many possibilities for sizing gravel. In this set-up, the feed from the scalping screen is minus 2-in. and the top deck (only half used) serves as a relieving deck. Note that the bottom deck has both 10-mesh and 4-mesh sections, the former serving to remove excess fines from the Ohio No. 9 gravel (95-100 percent passing 4-mesh, 0-20 percent passing 8-mesh, 0-10 percent passing 16-mesh).

Wash water for operations is obtained from a 4-acre pond, and delivered at 1000 g.p.m. by a 4-in. Weinman pump mounted on pontoons. Tailings from all parts of the plant are piped or flumed to a sump located beneath the Eagle sand tank, and transferred by a 6-in. Amsco sand pump to the pit for disposal.

(Please turn to page 126)

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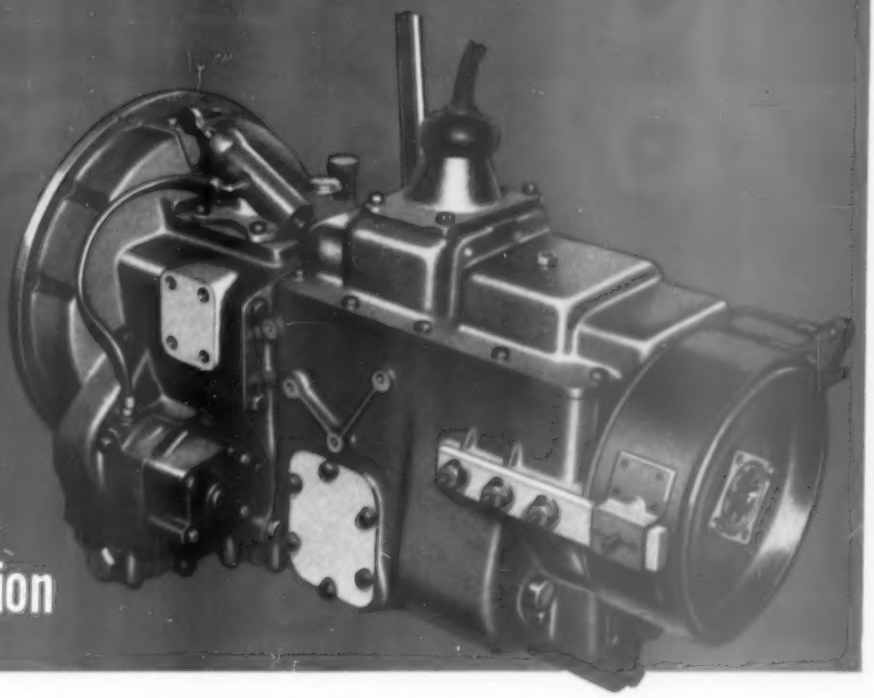

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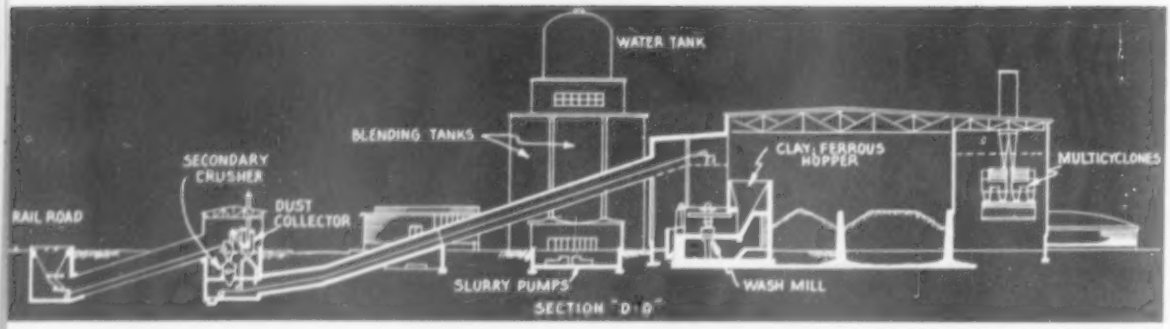
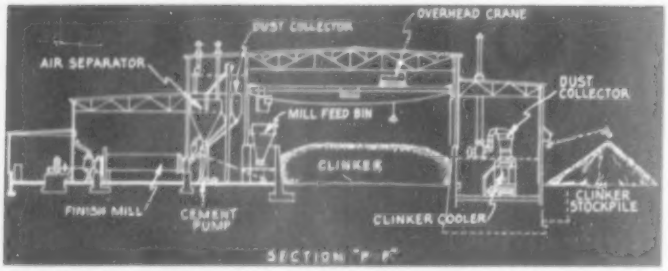


Above: Elevation view showing secondary crusher building blending tanks, covered storage area, exhaust end of kiln, slurry basin



Another elevation view showing finish mill, separator, clinker storage and cooler installations. Note that clinker can also be stockpiled outside of the kiln building

Inland Cement

(Continued from page 83)

In the initial quarrying operation, a 40-ft. bench is being developed at the base of the mountain. Drilling equipment consists of an Ingersoll-Rand wagon drill and several jackhammers, the former putting down 2½-in. holes. Millisecond delay blasting practices are used. Until sufficient floor space is made available for shovel and truck haulage units, the blasted rock will be moved and fed to the primary crusher by a Caterpillar D8 tractor-bulldozer.

The stone is reduced to minus 6-in. by a 42-65 Allis-Chalmers gyratory crusher having Hydroset mechanism. The crusher, driven by a 250-hp. slip-ring motor, has a capacity of 1000 t.p.h., although present cement plant requirements are only 4500 tons per week. The stone is loaded to 70-ton hopper-bottom rail cars by an inclined 48-in. undercrusher belt conveyor. Electricity for operation of the Cadomin plant is supplied by 350 kw. and 20 kw. diesel generators; major equipment is operated on 550 volts.

At the plant the limestone is unloaded to a 50-ton undertrack hopper, using a Hewitt-Robins heavy duty car-shakeout. A 30-in. conveyor, 90-ft. centers, which is fed by a Jeffrey-Traylor vibrating grizzly feeder, delivers the material to a Pennsylvania C-102-42 reversible hammermill for reduction to minus ¾-in. A Dings electro-magnet mounted at the conveyor head pulley removes tramp iron. The crusher, driven at 900 r.p.m. by a 350-hp. wound-rotor motor, has a capacity of 200 t.p.h. A Sly 9A Dynaclone dust collector (7000 c.f.m. capacity) vents the secondary crusher building and vibrating feeder, the collected particles being returned continuously to the circuit. Transfer to the storage hall or limestone feed bins is by means of an enclosed 30-in. conveyor, 230-ft. centers, followed at right angles by a horizontal 30-in. conveyor, 250-ft. centers, having a standard belt tripper. The same crushing and conveying circuit handles gypsum used in finish grinding. This material (minus 4-in. size) is brought in by rail from Winnipeg, Man. A short conveyor following the tripper delivers the ¾ x 0 product to storage.

The covered storage building, measuring 103 x 570-ft., has a capacity of 100,000 tons of cement raw materials and clinker; limestone and clinker each comprise 40 percent of the storage. Each raw mill is served by a limestone bin and sand bin, and each finish mill by clinker, gypsum, and additive bins. Each limestone bin has an overflow arrangement. A 14-ton Dominion Bridge overhead crane, carrying a 3½-cu. yd. Blaw Knox bucket, serves the storage area; the crane rails are 45 ft. above ground level.

Raw grinding is handled in open circuit by two 8- x 37-ft. Allis-Chalmers Compeb two-compartment mills, which are driven at 18.7 r.p.m. by 900-hp., 180 r.p.m. Westinghouse synchronous motors through Cutler-Hammer magnetic clutches. Limestone and sand are proportioned and fed to each mill by Merrick Type WS Feedoweights via an 18-in. belt conveyor, 30-ft. centers. The limestone feeders have capacities of 3-30 t.p.h., the sand feeders, 3-9 t.p.h. Each feeder has a starvation switch, which sounds an alarm when the flow is disrupted. A constant level feed tank is also available at each mill for feeding clay, ferrous slurry or limestone slurry for regrinding.

The mills carry 115 tons of molychrome cast alloy balls, ranging in size from 3- to 1-in.; they were supplied by Eastern Electrocasting Ltd., Montreal. Three and 2½-in. balls are used in the first compartment, and 2, 1½, and 1-in. balls in the second. Each mill has a capacity of 30 t.p.h. (of dry material) or about 40 t.p.h. of slurry, which has a 32 percent moisture content. An interesting feature is the use of the automatic Farval lubricating system for greasing the pinion and main gear. By means of a timer, (high viscosity) grease is ap-

(Please turn to page 96)

Manitowoc 2½ yd. Shovel Loads 22 Tons of Crushed Rock Every 82 Seconds!

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"Our Manitowoc is plenty beefy for this quarry work," said Mr. Carl Nelson. "We've got good service from this machine. We like it well enough that we're thinking of another one."

". . . easy to operate . . ."

Operator Allen Stokes commented, "I know the shovel can load even faster. It is easy to operate and beats anything I've been on. I like the way it handles when I move it, and its fast swinging speed. We have had no major repairs."

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SHOVELS 1-5½ YD. Speedcrane CRANES 20-100 TON

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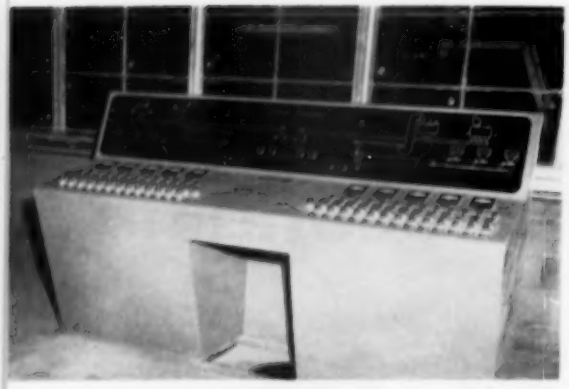

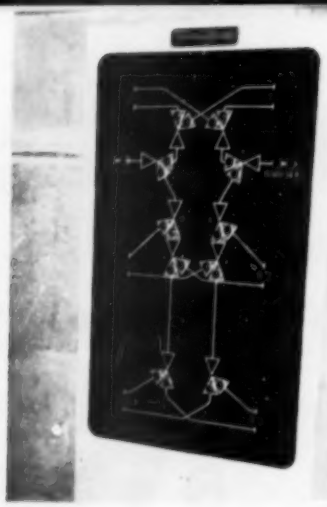

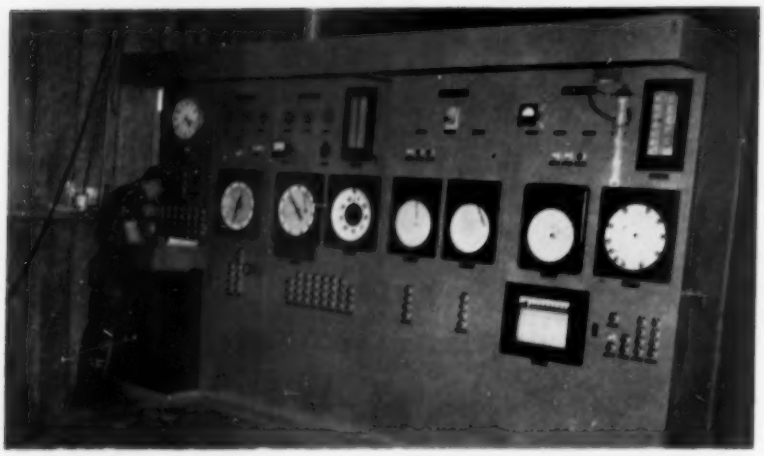

Upper Left: Control panel for cement grinding facilities. **Left:** Panel for operation of kiln. **Above:** Panel located in mill motor room shows position of cement pipe line valves serving six silos

plied every 6 minutes. The mills also have water cooled bearings.

Slurry handling and blending operation is highly flexible, involving the use of eight slurry tanks, a kiln feed basin, and nine slurry pumps. The tanks are built of reinforced concrete with conical steel bottoms, and comprise four 17- x 50-ft. and four 24- x 50-ft. units, with capacities of each about 11,000 and 20,500 cu. ft., respectively. Generally two of the larger tanks are used for blending and two for storage of limestone slurry, and the smaller tanks are used for clay, sand and ferrous slurry or as spares. A 4-in. Wilfley pump (another standby) transfers slurry from the raw mills to the tanks, and two 8-in. pumps (with 150-hp. drives) are used in blending and in transferring the corrected mix to the kiln feed basin. There is also provision to bypass the kiln feed basin in an emergency, the slurry going direct to the kiln ferris-wheel feeder. The tanks are interconnected by piping so that slurry can be transferred from any one tank to any of the other tanks. Slurry is agitated in each tank by air supplied at 60 p.s.i. by two two-stage 2400 c.f.m. Fuller Model C-250 rotary air compressors (one is standby); each is driven by a 400-hp. direct-connected motor. Air enters each tank through a 2 (or 3-in.) pipe suspended from the top, with the air being discharged near the base of the tank. The slurry piping system incorporates Saunders rubber-diaphragm valves.

The kiln feed basin is of interesting design, being partly underground and having a natural clay bottom. The underground section is made of reinforced concrete, the remainder of concrete block, with a gunite domed roof. The tank, with a diameter of 70-ft. and an effective depth of 18 ft., holds 70,000 cu. ft. of slurry, sufficient for about four days' operation. Slurry is agitated in the basin by a Dorr-Oliver mechanical-air agitator which is driven at 1 r.p.m. by a 15-hp. motor. Transfer of slurry to the kiln is handled by two 4-in. slurry pumps (one standby).

To facilitate the installation and maintenance of the pipe lines for slurry, compressed air, and natural gas, the company used a color code system to distinguish the lines. The raw mill department and the slurry handling, blending, and storage system are of sufficient capacity to handle the second kiln currently being installed.

The kiln is a 11- x 340-ft. Allis-Chalmers all-welded unit producing 2850 bbl. (Canadian) per day. It is supported on 5 tires, at a pitch of ½ in. per foot; and it is driven at about 70 r.p.h. by an air-cooled 125-hp., 400-1200 r.p.m. d.c. motor through a Falk reducer. The kiln rotation is synchronized with the ferris wheel slurry feeder through a 12-kw. synchronous-tie generator. An Allis-Chalmers gasoline engine is available as a standby drive. Both ends of the kiln are sealed, and the nose is air cooled by the clinker cooler fan. The chain section is 54-ft. long and incorporates about 10,000 ft. of ¾-in. chain; the links are round to minimize wear and thus extend chain life.

The refractory lining, 6-in. thick throughout, was supplied by A. P. Green Fire Brick Co. Ltd. Beginning at the feed end, the lining is as follows: 8 ft. unlined; 56 ft. abrasive-resistant red brick; 86 ft. of Empire

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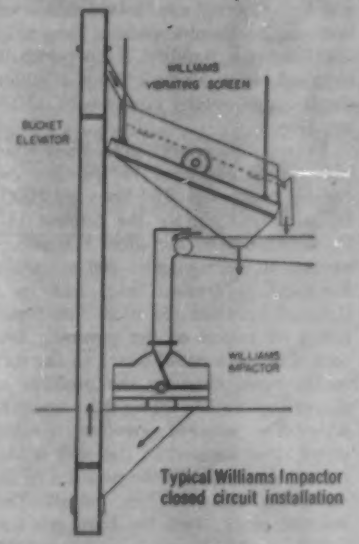
Open view showing hammers and impact blocks. Extremely rugged, heavy construction of steel plate with manganese steel liners, hammers and impact blocks. Extra large shafts are mounted in oversize bearings sealed in self-aligning housings.



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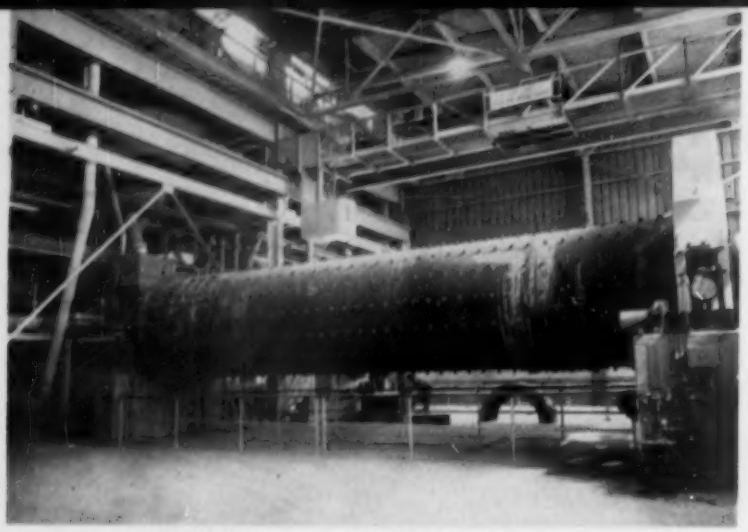


Finish mill department showing 8- x 37-ft., two-compartment mills and 16-ft. air separator. Note automatic lubrication system for mill gear and pinion. A 10-ton overhead crane also serves raw mills

(32-40 percent alumina) bricks; 103 ft. of hot zone (40 percent alumina) brick; 85 ft. of Kruzite (70 percent alumina) brick; and 2 ft. of hot zone (40 percent alumina) brick.

The kiln is fired with natural gas having a low sulphur content and a 950 B.t.u. per cu. ft. rating. The gas is brought to the plant through a 6-in. main at 150 p.s.i., and reduced to 20 p.s.i. for kiln use. (For domestic use, the pressure is further reduced.) The kiln has a 10-in. burner pipe, and primary air is supplied by a Chicago Blower size 16-40 fan (15-hp. drive). Fuel consumption is about 2000 c.f.m., or about 980,000 B.t.u.'s per barrel of clinker.

Gases are exhausted from the kiln by means of a Canadian Sirocco Size 440 double inlet ⅗ double width induced draft fan of 90,000 c.f.m. capacity; it is driven at 1040 r.p.m. by a 200-hp. induction motor. Dust is removed by a set of eight Buell cyclones and a Buell 60,000-v. electrostatic precipitator in series. The cleaned gases exhaust to atmosphere through a 6- x 100-ft. steel stack. The dust collection system, which has an efficiency of 98 percent, is arranged in two parallel circuits, so that one-half of the units can be serviced while the remainder keep operating. An elaborate lockout system is used in conjunction with the precipitator, which insures cut-off of power before anyone can enter either of the precipitator chambers. Dust is removed continuously from the precipitator electrodes by mechanical rappers, and is transferred from the parallel collecting hoppers by a 12-in. screw conveyor system to a truck hopper for disposal. Plans call for returning the coarser multicyclone product to the kiln and selling the finer precipitator dust as fertilizer.

Clinker is discharged from the kiln to a 6- x 33-ft. Fuller air quenching grate cooler, which effects a temperature reduction to 140 deg. F. Cooling air is supplied by a New York Blower No. 490 fan of 43,000 c.f.m. capacity, which is driven by a 60-hp. motor. Part of this air serves as secondary air for the kiln, while the remainder is vented to atmosphere through a Buell Type LR dust collector by means of a 25-hp. fan of 27,000 c.f.m. capacity. The inlet damper on the excess air fan is automatically controlled according to the pressure above the cooler grate. Another feature is the automatic control of the cooler bed speed (and hence thickness of bed) according to the temperature of the clinker.

A unique feature of the cooler installation is a bar grizzly (with ¾-in. openings) mounted at the discharge end of the cooler and ahead of integral Type C heavy duty clinker breaker. With this arrangement, clinker crusher and screens are not required, the clinker breaker being adequate to reduce the plus ¾-in. clinker to the required size.

Clinker is transferred to the covered storage area by one of two drag chain conveyors and bucket elevators in series. One of the drag chains is reversible, which enables excess clinker (particularly during winter operation) to be stockpiled north of the kiln building; this unit feeds a bucket elevator which in turn feeds a radial stacker conveyor. This material later can be reclaimed to a ground level hopper which discharges to the second drag chain conveyor.

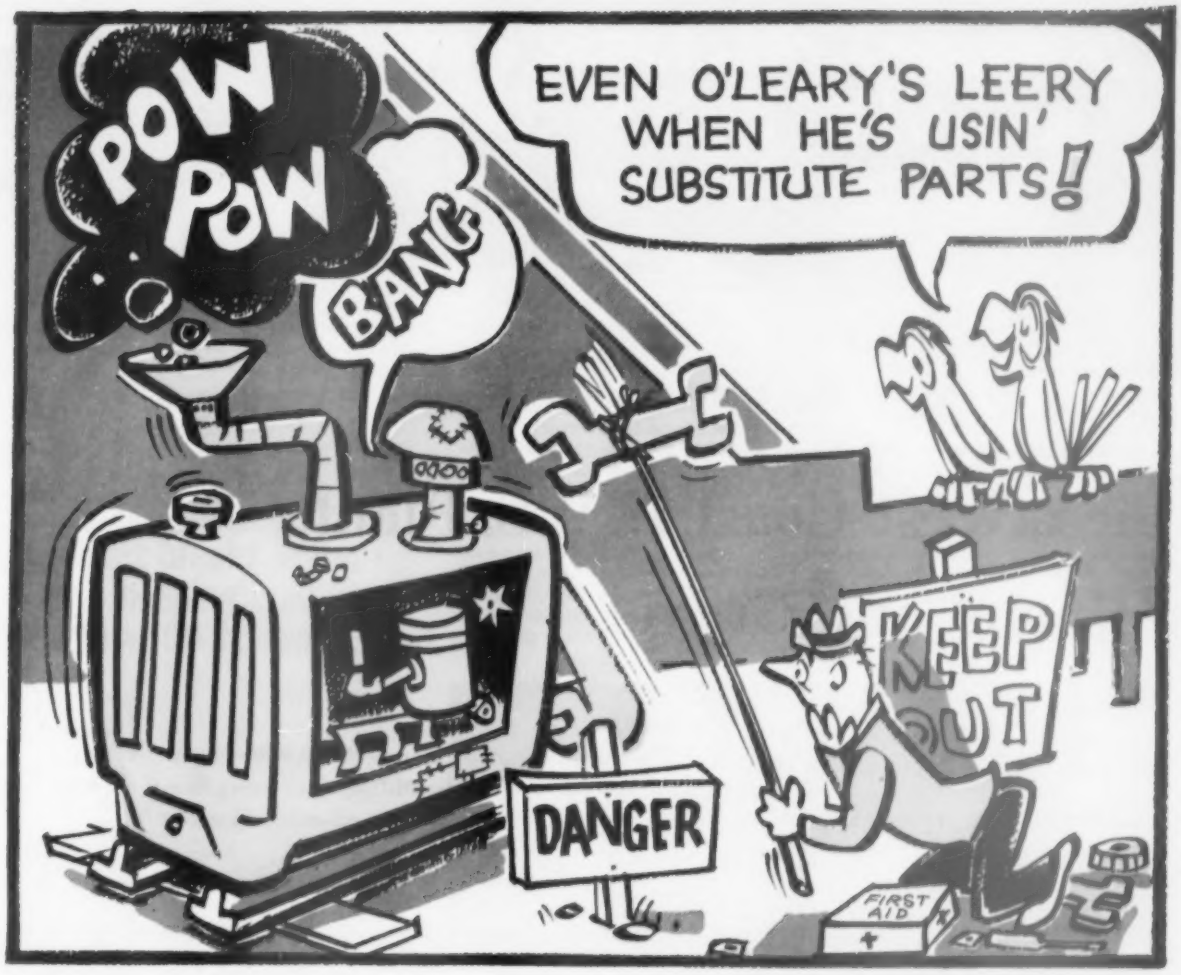
The Inland plant features elaborate controls for operation of the kiln, cooler, and related equipment. Controls and instruments are mounted on a pressurized master kiln control panel supplied by Minneapolis - Honeywell. Among the variables measured are kiln, cooler, and gas temperatures; kiln, slurry feeder, and cooler speeds; gas pressures in the kiln, kiln housing, and coolers; etc. A key instrument is the Bailey oxygen and combustibles analyzer and recorder. Kiln temperatures average 2700 deg. F. in the hot zone, 1100-1200-deg. F. 20 ft. below the chain section, and 550 deg. F. in the feed end housing. Optimum pressures are 2½ in. wg. in the feed end housing and 0 in the kiln hood. The kiln panel also has speed controls for kiln, slurry feeder, and cooler, and controls for regulating the fuel supply, primary air, and position of dampers.

The finish grinding department is practically identical to the raw grinding department, involving the use of two 8- x 37-ft. Compeb mills which are served by individual Merrick Feedoweights. Approximately 4 percent gypsum is used, the gypsum and clinker being delivered to each mill by belt conveyor. Identical drives, ball charges, and automatic lubrication are used on both finish and raw mills. Individual mill capacity is 30 t.p.h., at 2900 Blaine fineness.

Each mill is operated in closed circuit with a 16-ft. Sturtevant air separator, the product being transferred to the separators by means of screw conveyors and bucket elevators. Tailings are returned to the mills by gravity, and finished cement is screw-conveyed to one of two 7-in. Fuller-Kinyon cement pumps for transfer to the packhouse. The pumps, driven by 100-hp. motors, can serve either or both mills simultaneously; generally one acts as a standby. Each pump is supplied air at 30 p.s.i. from a Fuller single stage rotary compressor (100-hp. drive).

Two 6-in. cement pipe lines (one per pump) are used to transfer the cement to storage. The lines are 1000-ft. long, and elevate the cement 110 ft. to the top of the silos. For accessibility in maintenance, the pipes are mounted at ground level and in a stairwell between the silos. For facilitating operation of the pumping system, there is a panel board in the mill motor room showing the position of the valves used in filling the respective silos. The cement grinding control panel, also located in the mill motor room, also indicates the position of the valves for the two 7-in. pumps. This control panel, used for both grinding

(Please turn to page 116)



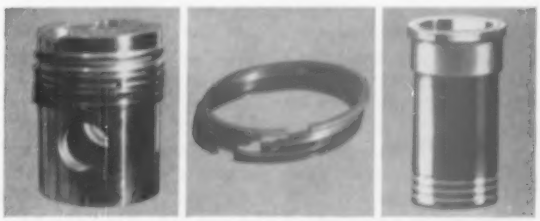
Somebody mention replacing a piston? Remember . . .

Caterpillar pistons are of special aluminum alloy—light, yet extremely heat-resistant and strong. CAT* rings are cast from fine grain alloy iron; their honed sides and lapped faces mean better sealing, smoother break-in. *Chrome*-plated rings offer increased resistance to wear. And 21 complete quality-control checks insure the fit, performance and long life of each Cat liner. You're sure of top quality, throughout.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



Cat pistons, rings and liners are the result of years of Caterpillar experience and research. Their thousands of trouble-free working hours can cut your operating costs substantially. Why take a chance with substitutes?

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General view of plant showing truck load-out bins, extreme left; stockpile over reclaiming belt conveyor, next in line; and to the right is the HMS plant and bins

First West Coast H.M.S. Plant In Sand and Gravel

UPGRADE

. . . coarse aggregates in new $500,000 Sisquoc, Calif., plant of Southern Pacific Milling Co., using heavy media separation unit to remove objectionable material

By WALTER B. LENHART

To Southern Pacific Milling Co., goes the distinction of installing in its new $500,000 Sisquoc, Calif., plant the first heavy-media separation installation in a sand and gravel plant west of the Mississippi River. This company's use of heavy media may well set a pattern for similar western operations to up-grade coarse aggregates. With an overall capacity of 225 to 250 t.p.h., this plant also features flexibility of blending in the screening and washing section, and it may be changed over to either dry or wet processing. The plant is 15 miles south of Santa Maria and 100 miles north of Santa Barbara.

Gravel at Sisquoc was stream deposited and contains a light colored (almost white) soft stone or shale that is objectionable because of high absorption and high sodium sulphate losses. The remainder of the gravel is dark colored, hard and durable. Due to the marked differences in color of hard and soft materials, visual control of the heavy media operation is possible and adds to the efficiency of the operation. The tabulation that follows gives the absorption, specific gravity, sodium sulphate losses, percentages of shale in feed and in "sink" and "float" products:

Specific Gravity of Media—2.40

	Feed	Sink	Float
% by wt.	100.	84.7	15.3
Absorption	3.0	1.5	13.2
Spec. Grav.	2.52	2.61	2.08
Sodium Sulfate 1055—5 cycles	7.5	3.2	31.5
% shale	17.2	4.5	91.0

The material is well within the specifications requirements of the Los Angeles rattler test.

Heavy media separation plant

The heavy media process for upgrading gravel has a so-called "media," or pulp in which the light gravel floats and the heavier particles sink thereby effecting a separation. One man runs the heavy media plant, a packaged Wemco Mobil-Mill using a 7-ft. dia. cone. In practice gravel from 1½-in. down to 4 mesh is processed. Sand is not included in the HMS circuit since it may cause an excessive media loss. The media used, 25 percent ferrosilicon and 75 percent magnetite, is delivered to the plant already ground by the shipper to about all minus 100 mesh. Media mixed with water forms a pulp having magnetic properties

NEW SAUERMAN SLACKLINE CABLEWAY INCREASES PRODUCTION OVER 25%

Bucket breaks water with heaping load from a 100 ft. depth...

Wherever deep digging is required and operating spans are long, the new Sauerman Slackline is adding to its margin of superiority over other types of excavators. Production increases of over 25% and in some unusual cases as high as 80% are reported.

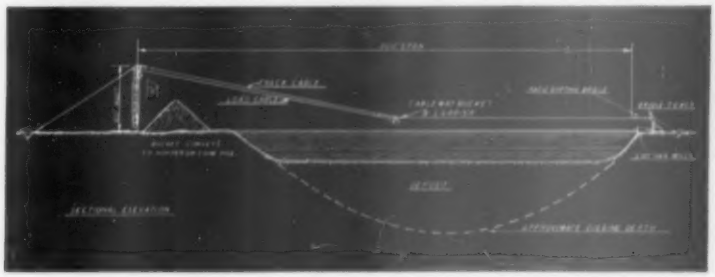
Not only is production increased but operating costs are lowered as cable and hoist wear is reduced and the machine runs with fewer peak loads and shocks—all possible from a cushioned drive using a torque convertor and other refinements.

These benefits are also available to present owners of slackline cableways. Guaranteed Gravel & Sand Co., a Sauerman Slackline user for over 35 years, has increased hoist speeds from 230 to 350 fpm. on the digging cycle and conveying speed to 800 fpm.—a gain of 25%. Guaranteed's 2-cu. yd. bucket is digging 450 ft. away from the surge pile and delivers 150 cu. yds. per hr.

The Sauerman Method lets you work distant material—up to 1,000 ft. away and dig 100 ft. or more below water. Now more than ever the greater tonnage available through fluid drive operation makes a Sauerman Slackline Cableway the low cost way for deep digging.

Get the best machine for your job. Write to Sauerman for expert advice on any materials handling project. For additional information on slackline cableways, ask for Catalog C.

is conveyed and dumped automatically at surge pile.



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Guaranteed Gravel and Sand Co.'s slackline bucket dumps 150 cu. yds. per hr. on surge pile from digging point 450 ft. away.

SAUERMAN BROS. INC. 630 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

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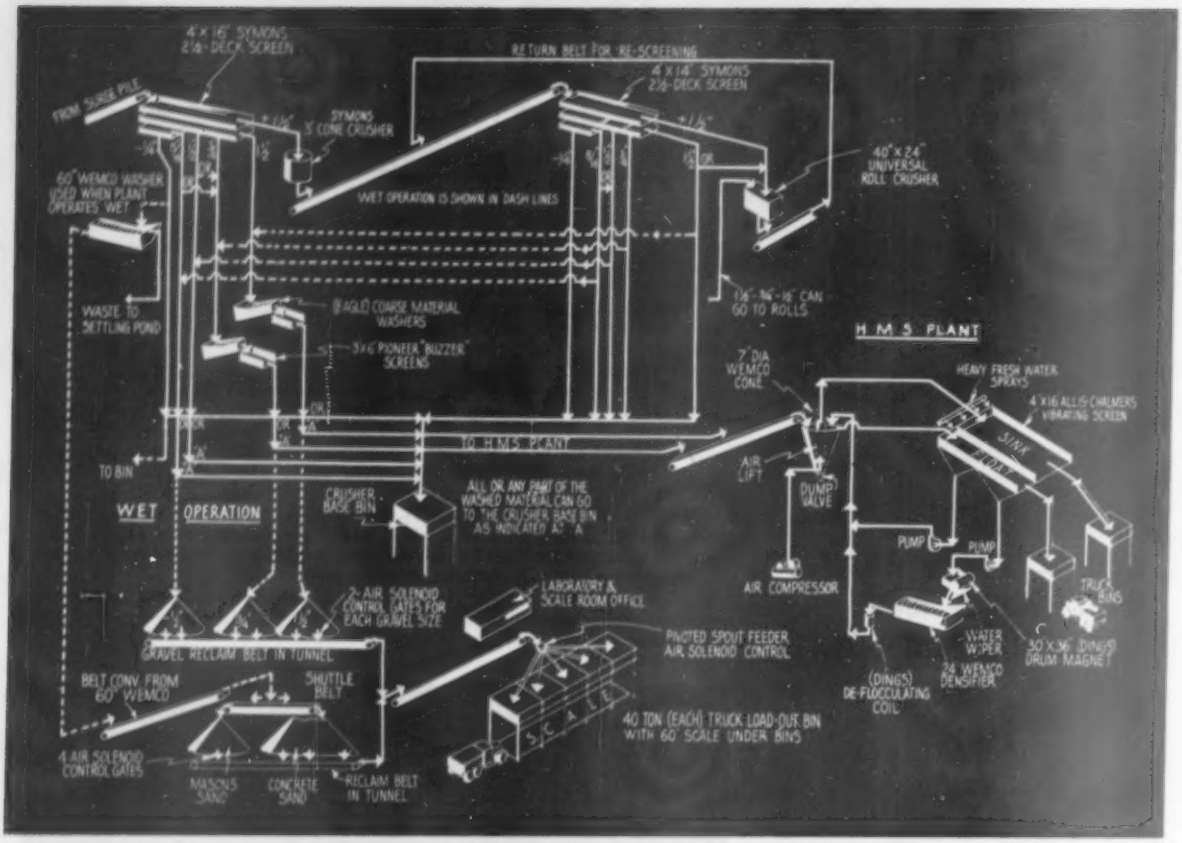
4' x 16' SYMONS 2½-DECK SCREEN
RETURN BELT FOR RE-SCREENING
4' x 14' SYMONS 2½-DECK SCREEN
FROM SURGE PILE
SYMONS 3' CONE CRUSHER
40" x 24" UNIVERSAL ROLL CRUSHER
60" WEMCO WASHER USED WHEN PLANT OPERATES "WET"
WET OPERATION IS SHOWN IN DASH LINES
WASTE TO SETTLING POND
EAGLE COARSE MATERIAL WASHERS
3'x6' PIONEER "BUZZER" SCREENS
1½"-¾"-16" CAN GO TO ROLLS
H M S PLANT
7' DIA WEMCO CONE
HEAVY FRESH WATER SPRAYS
4' X 16' ALLIS-CHALMERS VIBRATING SCREEN
SINK
FLOAT
TO H.M.S. PLANT
TO BIN
AIR LIFT
DUMP VALVE
WET OPERATION
CRUSHER BASE BIN
ALL OR ANY PART OF THE WASHED MATERIAL CAN GO TO THE CRUSHER BASE BIN AS INDICATED A, A
PUMP
PUMP
AIR COMPRESSOR
TRUCK BINS
2-AIR SOLENOID CONTROL GATES FOR EACH GRAVEL SIZE
LABORATORY & SCALE ROOM OFFICE
PIVOTED SPOUT FEEDER AIR SOLENOID CONTROL
WATER WIPER
30" X 36" DINGS DRUM MAGNET
GRAVEL RECLAIM BELT IN TUNNEL
BELT CONV. FROM 60" WEMCO
SHUTTLE BELT
(DINGS) DE-FLOCCULATING COIL
24" WEMCO DENSIFIER
40 TON (EACH) TRUCK LOAD-OUT BIN WITH 60' SCALE UNDER BINS
4 AIR SOLENOID CONTROL GATES
MASONS SAND
CONCRETE SAND
RECLAIM BELT IN TUNNEL

Flowsheet of screening, crushing and stockpiling facilities with heavy media separation unit shown to the right

that make possible the recovery of media by magnetic equipment.

Two sizes of gravel are currently being processed, a ¾-in. to 4 mesh, and a minus 1½-in. In the cone the sp. gr. of the media is held to 2.40. Thoroughly washed and scrubbed gravel, including some crushed material, is delivered by belt conveyor to the separatory vessel. The float product passes over the overflow lip to the washing screen, and the "sink" is removed from the cone by an air lift and delivered to the washing screen. This 4- x 16-ft., single-deck screen is divided longitudinally by a division plate. On one side is the sink product; on the other, the float. The split is on the basis of 75 percent of the screen for the sink and 25 percent for the float. High pressure water sprays wash off any entrained media. The media washed off at the upper end of the screen can be returned direct to the cone and the remainder of the wash water is pumped to a 30- x 36-in. drum-type, magnetic separator installed at the low end of the densifier. The densifier is a 24-in. dia. screw-type classifier used as a storage receptacle for the recovered and make-up media and for feeding the material back to the system uniformly. The drum-type magnet is an efficient and simple recovery unit. It is expected that the media loss will be less than 0.25 lb. per ton of feed. The HMS plant uses a total of 103-hp. of which 40-hp. is for the operation of the 155 c.f.m. compressor for the air lift.

Recently several tons of sized gravel from the company's Montalvo plant were put through the HMS unit on a test run. To insure a steady and uniform feed to the plant, the Montalvo gravel was first loaded into a ready-mixed concrete truck and then fed to the belt serving the HMS plant.

Nicholas Savage, manager of the Northern Division of the company

The new plant at Sisquoc has an overall capacity of 225 to 250 t.p.h. but since much of the output is highly satisfactory for many uses other than concrete, not all of the production is processed by HMS. The 7-ft. cone has a capacity of 65 t.p.h. on the ¾-in. to 4 mesh material, but on the minus 1½-in. the capacity is nearer 85 t.p.h.

The gravel plant uses belt conveyors for all inter-plant transportation. Flexibility of blending in the screening and washing tower is insured by an ingenious arrangement of flop-gates in a multiplicity of chutes and by-passes. Practically any type of material can be processed and blended in the plant itself. The plant can run wet, or, when crusher-run road base material is to be processed the plant can operate dry. Crusher run base material is minus 1½-in. Three sizes of gravel, ½-in., ¾-in., and 1½-in., are stockpiled over a reclaiming tunnel as are two

(Continued on page 104)

A. P. GREEN
Plastic and Castable Refractories

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A. P. Green Monolithic Hood in Modern Cement Plant

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In kiln hoods, coolers, and dust collectors of some of today's most modern cement and lime plants, the real and definite advantages of monolithic construction provide longer service, reduced maintenance costs, and higher thermal efficiency. Your A. P. Green representative will show you how you, too, can enjoy these money-saving advantages.

A. P. Green offers a complete line of refractory products for the cement and lime industry. Whatever your requirement, for specific recommendations without obligation, contact your local A. P. Green distributor . . . he's listed in the yellow pages of your telephone directory.

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Primary jaw crusher, below, with bottom-dump semi-trailer and tractor above

Secondary crushing station with rolls, to the left, and cone crusher, to the right, and two screens, above

sizes of sand: concrete and masons. Sink and the float products from the HMS plant are being binned but later the sink material will be stockpiled over a reclaiming tunnel. Crusher run base material is binned; however, the operators can also convey any single wet size or any combination of sizes to the crusher run base bin. Sand is recovered from the screening section by a 60-in. x 27 ft. 9-in. sand preparation machine.

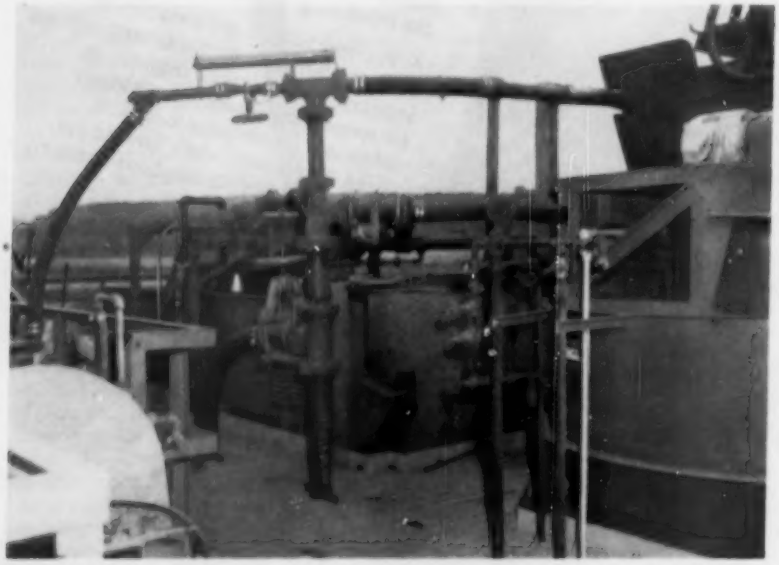
Sand from this 60-in. sand screw is delivered to a horizontal shuttle belt operating on an elevated gallery. One size of sand is made at a time, mainly concrete sand. For masons sand, screens are changed. The shuttle belt permits a large supply of sand to be stocked so that drainage is effective.

Rock ladders are used at coarser stock piles. A ladder at the surge pile is designed primarily to prevent any of the minus 3-in. gravel, being conveyed from the primary crusher to the surge pile, from falling direct to the vibrating feeder should the gravel be drawn low in the pile. All belts in the plant are 24-in. or less in width.

The main operating units in the plant are a 15- x 38-in. jaw crusher fed by a reciprocating feeder with a stationary screen-grizzly ahead of the crusher. Product of the grizzly and jaw is delivered to a surge pile above a reclaiming tunnel. From the surge pile a 48- x 60-in. electrically vibrated feeder delivers the material by conveyor to the soaking box ahead of the first vibrating screen. Secondary crushing is done with a 3-ft. cone and final reduction by a set of 40- x 24-in. rolls. Two sizes of gravel from the first 4- x 16-ft., 2½-deck vibrating screen (¾-in. and 1½-in.) flow to individual coarse material screw-type washers followed by a wash and rinse over individual 3- x 6-ft. "Buzzer" screens that act as de-watering units. Pre-determined amounts of $\frac{5}{16}$-in. and ½-in. gravel can be blended into the ¾-in. size and sent to the coarse material washer. Following the buzzer screens the two sizes of washed gravel can be by-passed and sent to the HMS plant. Since absence of adhering particles is important in selling for use on California highways, the gravel is scrubbed thoroughly at the plant. The sand equivalent, sodium sulphate, and other tests are carried on in the plant laboratory adjacent to the field office at Sisquoc.

A 1½-cu. yd. diesel powered drag line loads two bottom-dump semi-

(Continued on page 106)



Top deck of heavy media separation plant with part of cone shown to the right and washing screen to the left

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FORTY-FIVE minutes — an hour — two hours — yes, even four hours — that's how long it takes to change size setting on some gyratory crushers. Translate that lost time into tonnage, the tonnage into dollars — and you can readily see the tremendous profit advantage in *one-man, one-minute product control* — available only with this truly modern *Hydrocone* crusher.

Changing crusher adjustment to precise product size is a flick of a switch operation in the *Hydrocone* crusher. Compensation for wear is equally fast—equally simple. And if the *Hydrocone* crusher stops under load, flick a switch and you're back in operation.

For complete information, see your A-C representative or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin. Ask for Bulletin 07B7145B.

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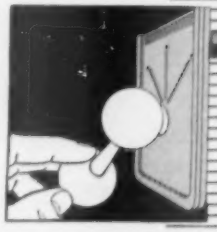

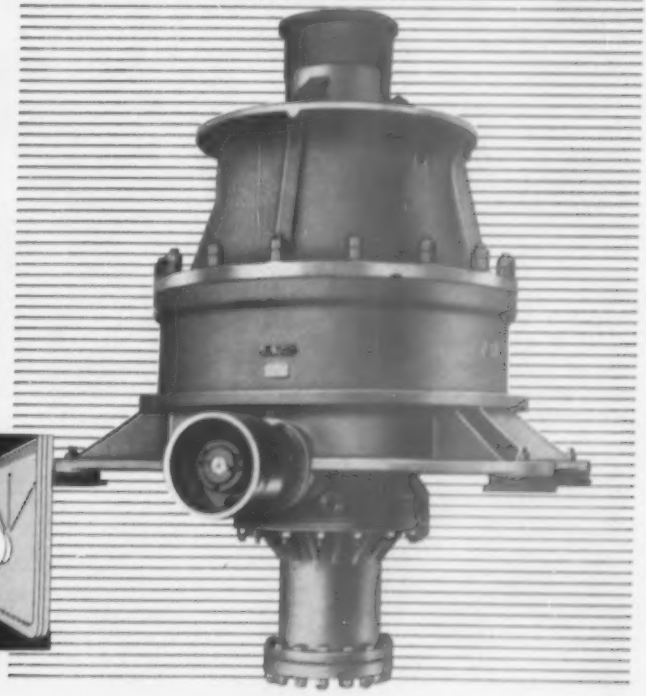

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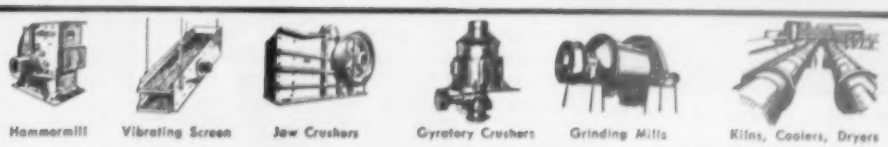

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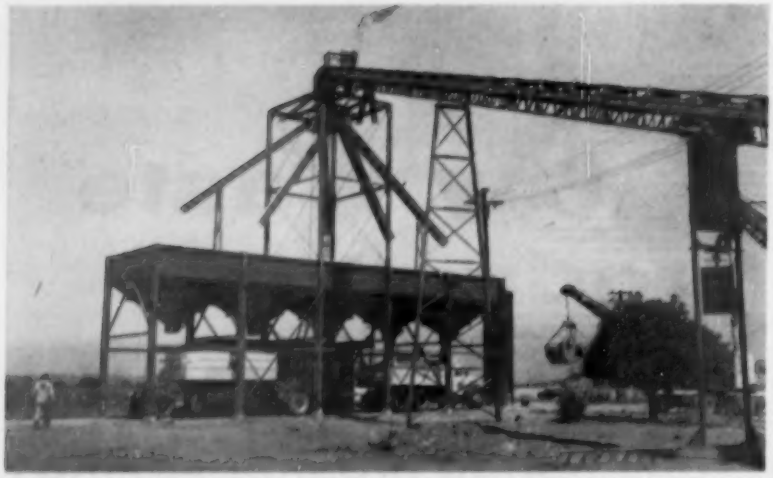


Truck load-out bins with scales underneath so that all haulage units can be weighed

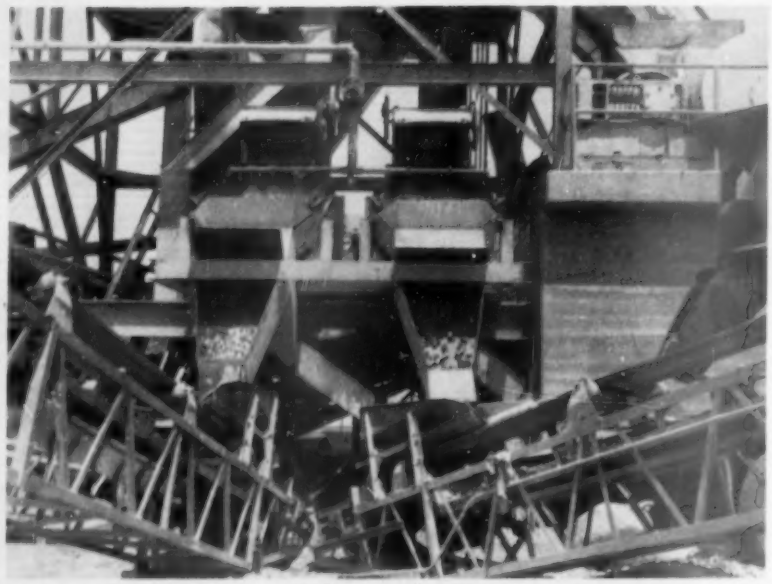
the storage reservoir to one of two plant pumps; a high pressure and a low pressure unit. Low pressure water is used mainly in the soaking box at the head of the first screen, sand screw make-water and in the coarse material washers. High pressure water is used on screen sprays, etc. Wash water from the HMS plant is clear after the media removal processing so this water is returned to the plant circuit. A liquid cyclone, 24-in. dia., has been installed to receive the water from the deep well pump. This is designed to remove any sand from the water.

The Southern Pacific Milling Co. is an old California organization. It owns and operates the Montalvo Rock Co., Oxnard; Santa Paula Rock Co., Santa Paula; and the El Rio Rock Co., El Rio. Ready-mixed concrete plants at

(Continued on page 116)

trailers, each hauling about 32 tons from the pit. Stone is hauled about a half mile over flat grades to the plant. At the plant the semi's drive up a dirt ramp and unload to a truck hopper under which is a flat, 14-in. grizzly. To expedite work, the outer track or the right hand half of the bridge over the grizzly can be tilted up side-ways to leave most of the grizzly free for the attendant.

The reclaiming tunnel under the finished materials is 7-' x 7-ft. There are two gates under each gravel pile and four under the sand. These quadrant-type gates are opened and closed by air-solenoid switches with control being in the scale house. From these stockpiles the material is delivered to one of five 40-ton truck loading bins arranged in a single row over a set of 60-ft. truck scales so that trucks can be weighed as loaded. A pivoted spout at the top of the bin installations serves any of the five bins. The quadrant-type gates under the truck loading bins are air-solenoid operated with their control and that of the pivoted spout centered at the same office control board. All shipments go out by truck with much of the trucking being done in company-owned units.



Two of the three "Buzzer" screens that serve as dewatering units

Gordon Tucker, manager of Santa Maria and Sisquoc plants

Water for the plant comes from a 600 g.p.m. deep-well pump in a 450-ft. deep, 20-in. well. The deep well pump delivers to a large diameter, vertical concrete pipe, the base of which is also connected by a flat, smaller diameter concrete pipe to a pond. Water is not plentiful in the area so the pond acts as a storage reservoir. The pump runs continuously unless shut down automatically when the pond is full. Water can be delivered from the deep well pump and/or

George E. Leal, plant and vehicle superintendent for the Northern Division

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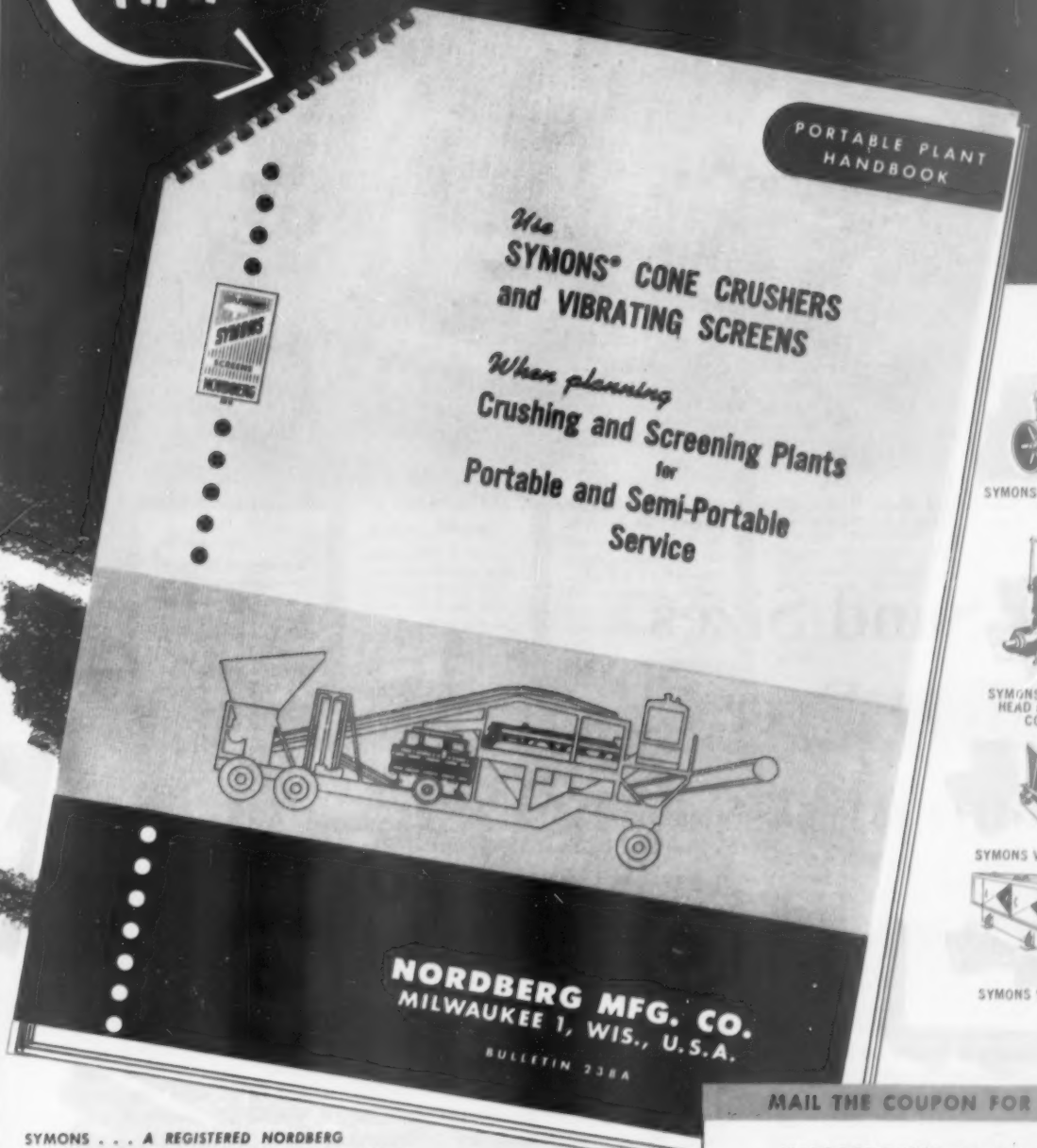
• Just off the press, this new 26-page Nordberg Portable Plant Handbook is full of suggested layout arrangements showing how to use *Symons Cone Crushers* and *Symons Vibrating Screens* with other related equipment in making up complete portable and semi-portable crushing and screening plants. If you are a user of crushers and vibrating screens, and are thinking of mobility, you'll want a copy of this new handbook. *Fill in and mail the coupon today for your free copy.*



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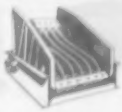
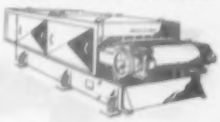

SYMONS VIBRATING GRIZZLIES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C656

View of sandstone quarry and plant. In the foreground is the primary crusher, and secondary crusher is in the background, to the right, on the quarry floor; plant is to the far left, in background

Many Sand Sizes Meet Every Buyer's Needs

BLENDING

. . . several basic sizes on automatic belt conveyor system in drying and screening plant produces 13 grades of glass and foundry sands. Portage-Manley Sand Co. operates two-stage crushing and flexible field conveyor in quarry

By KENNETH A. GUTSCHICK

SINCE TAKING OVER A SMALL CRUDE SILICA SAND PLANT in Portage, Wis., in 1943, the Portage-Manley Sand Co., Inc., Rockton, Ill., has constantly expanded the operation until it now produces about 4000 tons per day of high quality industrial sands for the foundry and glass industries. In the last 13 years, the company revamped the quarry operation, installed drying and dust collection equipment, and built a new screening plant.

Several interesting features characterize the present operation. In the sandstone quarry, two stage crushing is combined with a flexible field conveyor system to deliver a minus ¾-in. product to the drying plant located at the surface; these quarry units are portable, thereby effecting a high degree of flexibility. After drying, the sand is scalped in two stages, using trommel screens. Final sizing is handled by a battery of 28 vibrating screens, which produce several basic sand sizes. These sizes are later accurately blended on an automatic belt conveyor system to produce 13 grades of sand required. Dust is minimized through venting of all dust-generating facilities to a coke filtration-type collector.

The company employs a dry pit operation, with the quarry floor bottomed 3 - 4 ft. above the water table. Silica sand is obtained from the horizontal, massive-bedded Dresbach sandstone formation (Cambrian age), the face

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*AMSCO MANGANESE STEEL . . . plus AMSCO HARDFACING

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CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

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AMERICAN Brake Shoe COMPANY

AMSCO

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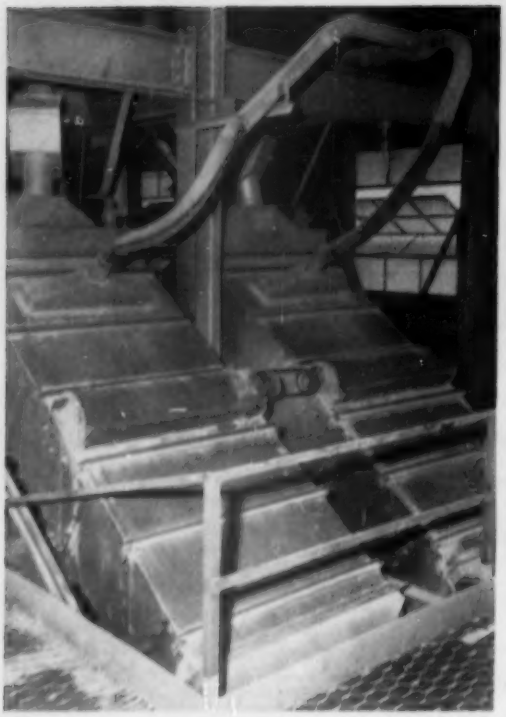


Above: Close-up of multi-pipe distributor which spreads sand evenly across screen width

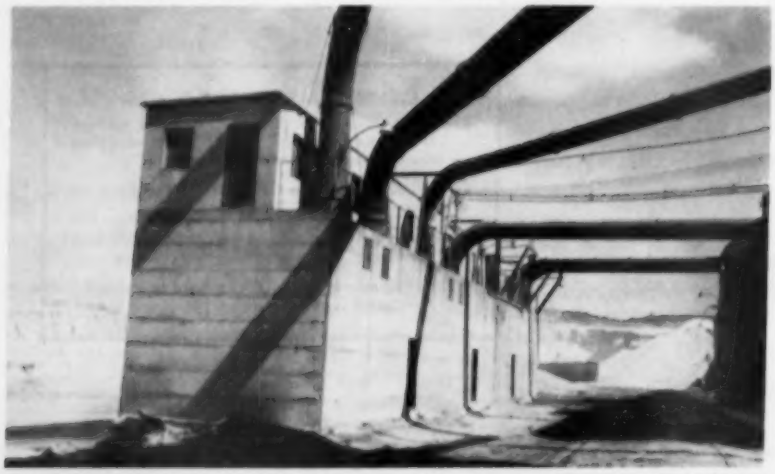
Left: Pair of 3½- x 8-ft. double-deck screens for producing basic sand sizes. Note enclosed gate and distributor at final end. Screens are vented to a dust filtration unit

varying from 60 to 80 ft. The sandstone is of exceptionally high purity, the silica content averaging 99.58 percent. The following is a typical chemical analysis:

	Percentage
Silica	99.58
Iron Oxide	.021—.026
Aluminum Oxide	.20
Titanium Oxide	.011
Calcium Oxide	.01
Magnesium Oxide	Trace
Loss on Ignition	.17
Fusion Point	3050 deg. F.

The overburden, consisting of 10 to 40 ft. of poorly-consolidated shaly sandstones and shales, is removed on contract by Caterpillar tractor-scraper teams without recourse to blasting. Drilling is handled by a gasoline-driven Bucyrus-Erie 22W well drill, putting down two (6-in.) holes daily. The burden is 20 ft., and the spacing varies from 26 ft. in the winter to 30 ft. in the summer. Two holes are shot at a time, using 5-in. DuPont explosives, 550 lb. per hole. Detonation is accomplished with Primacord and Primacord 25-ms. connectors. Blast holes are drilled several feet below the quarry floor in order to eliminate toe development and to insure a dry floor condition.

Although the sandstone is well-indurated, blasting and other quarry operations have necessarily produced a loose sandy floor, which makes truck haulage a virtual impossibility. This explains the use of belt conveyors to deliver the quarried material to the plant. This dry method of operation was preferred over hydraulicking for several reasons, the most important being that washing would remove the fines needed in foundry sands. It was also felt that hydraulicking would be slower and that severe winters might curtail operations. However, the company may switch to the hydraulic method if the quarry is deepened (below the water table) in the future.



Coke-filtration building. Each duct leads to a 90-in. fan that draws the dust-laden air through coke filter bed and water sprays

The primary crushing plant is portable and incorporates a 5- x 12-ft. grizzly feeder-hopper, a Pioneer 3042 jaw crusher, and a short undercrusher conveyor; it is mounted on four Athey wagon crawler wheels, which permit the unit to be moved readily throughout the quarry. During actual operation, the plant is stationed as close to the muck pile as possible. Two digging units are used—the first, a 2½-cu. yd. Northwest 80D diesel shovel which casts the sandstone into piles, followed by a Koehring 605 diesel crane carrying a 1½-cu. yd. clamshell which feeds the grizzly-hopper at about a 300-t.p.h. rate. The shovel operator, in charging the piles, drops the material from a maximum height to insure maximum breakage. The crusher is

(Continued on page 112)

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5 "Euc" SCRAPERS . . . 7 to 18 yds. struck

MORE WORK-ABILITY... BETTER ACCESSIBILITY

Ease of operation and maintenance and production performance have made Euclid the fastest selling scraper line in the industry. Advanced design of Euclid's hydraulic lever action provides fast, positive and independent control of bowl, apron and ejector . . . downtime and expense of cable replacement is eliminated. The low, wide scraper bowl, with adjustable 4-section cutting blade, assures fast, easy loading in any material. All major components in every Euclid scraper are readily accessible . . . another reason why *Euclids are your best investment.*

EUCLID DIVISION, General Motors, Cleveland 17, Ohio

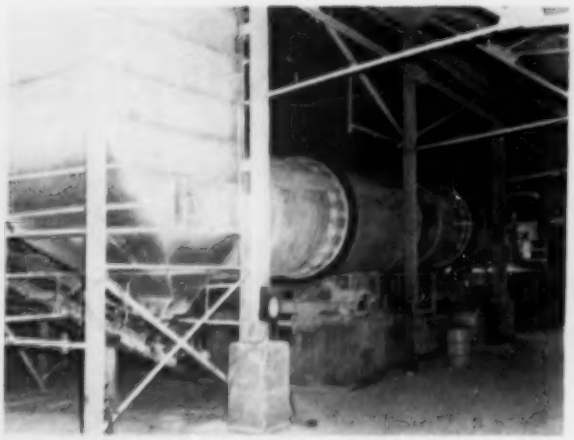
These overhung engine models have struck capacities of 7, 12 and 18 yds. . . . are powered by 143, 218 and 300 h.p. engines. The S-7 and S-12 have 5 speed transmissions . . . S-18 has 300 h.p. engine and Torqmatic Drive. With full power steering, these scrapers are easy to operate . . have exceptionally good maneuverability.

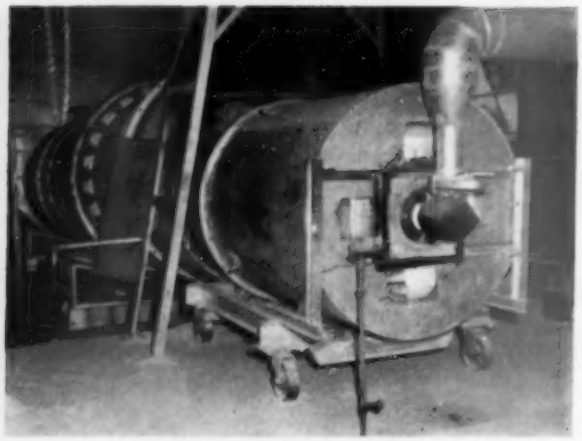
15½ yard Scraper has a 4-wheel tractor for maximum stability on long hauls at fast travel speed. It is powered by a 300 h.p. engine with either a 10-speed transmission or Torqmatic Drive. Heaped capacity at 3:1 slope is 18 yds. . . . 21 yds. at 1:1 slope. Drive and scraper tires are 24.00 x 25 with 29.5 x 25 optional.

TS-18 is the newest Euclid Twin-Power Scraper. A one-man earth-moving outfit, it has tremendous power and traction . . . self loads and can work on steep grades and the toughest jobs. Powered by two 218 h.p. engines, each driving through separate Torqmatic Drives. Tractor is available with 300 h.p. engine for work where even more power is needed. Tires are 27.00 x 33 with 33.50 x 33 optional. Heaped capacity at 3:1 slope is 21 yds. and 25 yds. at 1:1. The TS-18 has set new standards of scraper production and low cost yardage.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



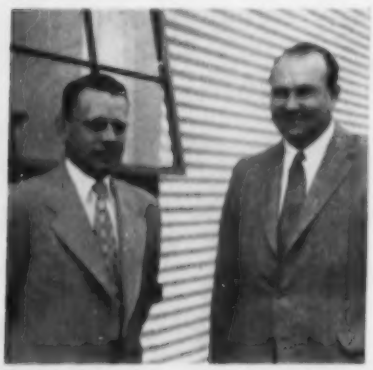


Left: Dust chamber and 7- x 50-ft. rotary dryer. Temperature recorder in foreground. Sand discharge temperature is 150 to 180-deg. F. **Right.** Oil burner for rotary dryer

driven by a 100-hp. motor and is set with a 3-in. opening; the grizzly openings are also 3 in. Both the crusher bypass fines and the crusher product join on the undercrusher conveyor and are carried to the first of the portable field conveyors.

The pit haulage system is a series of individual 24-in. Barber-Greene conveyors, varying in length from 60 to 400 ft. and having a total length of over 700 ft. Each conveyor is mounted on wide flange steel wheels for maneuverability. The last unit discharges to the secondary crushing station in the pit; this unit incorporates a scalping screen, a 4022 double roll crusher, and an off-bearing conveyor. It is also portable, being mounted on wide flange steel wheels. However, at present, it is positioned permanently and discharges to a stationary, inclined 24-in. conveyor, 315-ft. centers, which carries the minus ¾-in. material to a 24-in. swinging stacker conveyor, 85-ft. centers, which feeds a 20,000-ton surge pile.

From the stockpile, sand is loaded by a 1-cu. yd. clamshell into a 25-ton hopper, and carried out of the quarry by a 24-in. inclined conveyor, 400-ft.



Wm. P. Chadwick, treasurer and sales manager, and **Karl O. Geng,** president

centers, to a 100-ton dryer bin in the main plant. This conveyor is charged by a Syntron vibrating feeder and is housed in a gallery.

From the plant surge bin, sand can be fed either to a pair of rotary dryers or to a separate crude sand circuit. In the latter, a 24-in. belt conveyor feeds a battery of four 42-in. by 8-ft. Universal single-deck vibrating screens in parallel; each is fitted with slotted wire cloth having ¼- x 3-in. openings. Another 24-in. conveyor delivers the finished product to rail car loading, while the tailings are belt-conveyed to an outside waste bin.

The dryers, mounted in parallel, are 7- x 40-ft. and 7- x 50-ft., respectively; each is fed by 30-in. dia. pipe issuing from a Syntron vibrating feeder. The latter permits the rate of feed to be varied according to the moisture content and temperature of the sand. Each dryer is served by a Johnston firebrick lined burner which uses No. 2 fuel oil; oil consumption averages 1½ gal. per ton of sand dried. The dryers are driven at 7 r.p.m. through Jones reducers and double-strand chain by 50- and 100-hp. motors, respectively. The sand discharge temperature, measured on a Brown recorder, is maintained at 150-180 deg. F. Each dryer has a dust chamber at the discharge end, which is vented to a dust collector.

The dryers and all related equipment are operated from a control panel mounted on the burner floor. Among the important controls available are bin level indicator lights for both the surge bin and the dry sand silos ahead of the finish screening department; these are used to govern the drying operation.

After drying, the silica sand is scalped in two stages to insure removal of all oversize particles. The first scalping unit is a 4- x 12-ft. enclosed trommel screen, having ½-in. round openings; it is fed by a 24-in. belt conveyor, 60-ft. centers, issuing from the 40-ft. dryer (a short interconnecting conveyor serves the second dryer). The scalper rejects are carried to an outside waste bin by a 20-in. conveyor, 150-ft. centers, while the throughs are taken by a 30-ft. bucket elevator to a surge hopper ahead of four 4- x 5-ft. enclosed trommel screens mounted in parallel; these are fed by individual 10-in. pipes. Each trommel jacket is fitted with slotted wire cloth having 0.032- x ¾-in. openings. Tailings are returned to the 20-in. "waste" conveyor by means of screw conveyors, while the throughs are collected in a hopper, and carried to two concrete-stave silos by means of a screw conveyor, 24-in. belt conveyor, 120-ft. centers, and a bucket elevator, 80-ft. centers, in series. Each silo is 65-ft. high, holds 1000 tons, and is equipped with bin indicators at six levels. The indicating lights are mounted on the dryer control panel, and also on a panel at the base of the silos.

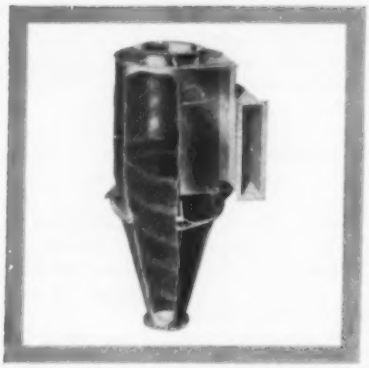
The silos are drained through three quadrant gates each, the dried sand dropping onto a two stage 30-in. belt conveyor (60- and 30-ft. centers, respectively), which feeds a two-stage bucket elevator (70 and 65-ft. centers, respectively). The latter discharges to a 30-in. conveyor, 20-ft. centers, which charges a 10-ton surge bin at the top of the screening building. An important feature is that the conveying system is electrically interlocked and is controlled automatically by high and low level indicators in the 10-ton feed bin. In this operation the reclaiming gates under the two silos are kept open, and the conveying system starts and stops according to the material level in the bin.

The following table gives the 13

(Continued on page 114)

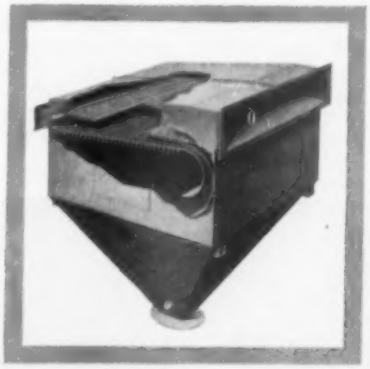
How Buell's Exclusive Rapping Mechanism delivers Extra Dust Collection Efficiency

ORDINARY RAPPING
Shakes dust from collecting electrodes. Re-entrainment of cloud of dust reduces precipitator efficiency
BUELL RAPPING
Shears dust from collecting electrode surface, minimizes scattering and re-entrainment



Buell Cyclones offer two "extra-efficiency" advantages: (1) exclusive Shave-off which harnesses double-eddy and puts it to work, and (2), large diameter design which eliminates clogging.

Complementing the extra efficiency of rapping in Buell "SF" Electric Precipitators, the unique Spiralectrodes add further efficiency through 50% to 100% higher electron emission, constantly accurate spacing, longer electrode life.



Buell's Low Resistance Fly Ash Collector combines top efficiency with low draft loss, for natural or forced draft installations. Ideal for boilers from 100 to 2000 BHP.

For more specific data about Buell's *extra efficiency*, write Dept. 17-J, Buell Engineering Company, 70 Pine Street, New York 5, N. Y.

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MECHANICAL ELECTRICAL

Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

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SCREEN	595	705	720	505	510	515	520	410	420	430	XC-50	XC-70	Sand Blast
On 20													3.6
30								1.2	2.2	7.6	10.3	28.3	51.6
40					.8	1.6	2.9	10.7	18.1	32.2	45.4	43.7	37.4
50		.5	1.4	3.2	9.0	14.7	20.2	25.7	30.7	29.5	38.3	22.3	5.6
70	.7	5.7	13.7	27.6	28.6	31.7	28.3	31.0	25.2	16.9	5.4	4.6	.9
100	14.9	35.6	39.3	40.4	36.7	31.4	24.7	20.8	15.7	9.4	.4	.9	.5
140	44.8	37.9	31.2	20.2	17.9	15.1	10.4	8.1	6.0	3.1	.1	.2	.3
200	28.9	16.2	11.4	6.7	5.5	4.4	3.0	2.0	1.7	1.1			
270	5.8	3.7	3.0										
Pan	1.9	1.3		1.8	1.2	.9	.5	.5	.4	.2			.1
Approx. A.F.S Grain Fineness	119.34	98.95	91.08	75.44	72.43	67.70	61.49	56.29	51.32	43.25	34.08	30.82	25.54
Approx. Base Perm. (Dry)	35.	45.	50.	60.	70.	80.	90.	115.	140.	200.	300.	500.+	500.+

Approx. Wet Perm. at Critical Moisture—160% - 175% of Base Perm. (Dry)

A.F.S. Clay—All Grades—Less Than .5%

grades of dried and screened silica sand produced by the Portage firm; these are made from six basic sizes produced in the screening plant which are blended on a unique belt conveyor system prior to loading out. Note that 520 sand designates 20 percent retained on the 50-mesh sieve, 410 designates 10 percent retained on 40-mesh, etc. The first three grades were recently developed by the company, particularly for use in the shell molding process.

The screening building, built in 1951, is 140-ft. high and consists of four screening floors and a group of twelve 400-ton reinforced concrete bins, which are arranged in three rows of four each. The plant is equipped with 28 totally-enclosed 42-in. x 8-ft. Universal double-deck screens. In the south half of the building, from the top down, the floors consist of 2, 6, 5, and 3 units, respectively. Fourteen of these units, arranged in two series of seven each, are used in normal operations, the other two for special sizes. In the north side of the screen house, the company recently installed 12 new screens, which are arranged in three series of four screens each. Total screening capacity is in excess of 4000 tons daily, the plant being operated around the clock.

In the 14-screen circuit, the feed from the 10-ton bin is distributed equally via 8-in. pipe chutes to eight (primary) screens, where two basic sizes are produced, with rejects from the top decks going to the four secondary screens. Two more finished products are taken off on this floor, with the bottom deck throughs being piped to the two tertiary screens. This pair produces three more basic sizes, one of which (the bottom deck throughs) is identical to the bottom deck throughs produced on the primary screens.

To promote screening efficiency, the company has developed a multi-pipe distributor which spreads the load evenly over the screen width; the unit has an adjustable spreader gate for regulating the feed. A common practice is to brush the screen cloth every 20 minutes to prevent blinding. Throughout the screening operation, individual screens may be by-passed through use of specially-designed pivoted cut-off gates built into the pipe chutes.

In the loading-out operation, one carload of material is blended and weighed at a time. Each row of four bins is served by a 30-in. tunnel reclaiming conveyor, 60-ft. centers, each discharging at right angles to a 30-in. collecting conveyor, 105-ft. centers. The latter conveyor is equipped with a Fairbanks-Morse scale to determine shipping weights. Since the conveyors operate at constant speed, variations in proportioning the basic sand sizes is effected by varying the individual bin gate openings. Based upon years of operating experience, the company has developed a table of gate openings for the various grades required. For some products, as many as three sizes may be blended together simultaneously.

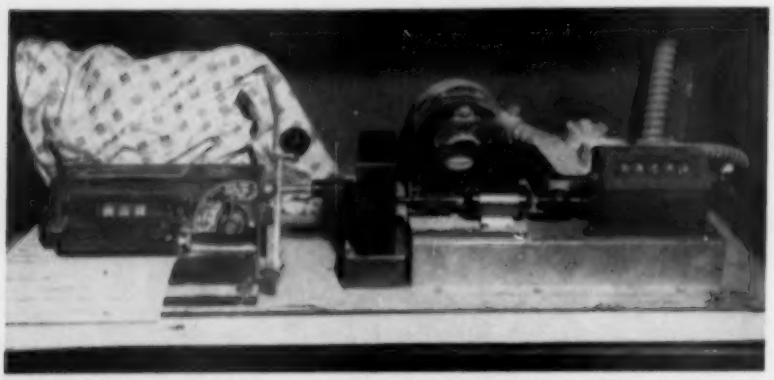
The blending system is automatic, based upon the use of a Veeder-Root predetermining counter which is synchronized with the belt conveyor scale. When the preset weight on the counter is reached, a device is actuated which automatically shuts the various bin gates, although the conveyors keep operating until the belts are empty. Simultaneously a second counter stamps the weight on the delivery ticket. Both counters are driven simultaneously through a common shaft by a Selsyn motor, which in turn is synchronized with a Selsyn generator mounted on and operated by the conveyor scale.

The bin gates (quadrant-type) are operated through an intricate lever system, which incorporates a main shaft paralleling the collecting conveyor, which is connected to a series of lateral levers, each of the latter being connected to a bin gate. Each gate is cranked open (manually) through a geared-hand wheel, according to the opening specified on the loading card. The gates are opened in increments of 1/10, using an accurate indicator scale mounted at the end of each gate lever; and they are closed automatically, by means of a counterweight, which upon releasing, turns the main shaft, which in turn pulls the bin gates to a closed position.

During the loading operation, the weighed car load of material is taken from the collecting conveyor by a bucket elevator, 50-ft. centers, to one of two loading-out silos. Use of two silos permits uninterrupted car loading, since one silo can be loaded and the other unloaded simultaneously. Each silo has two draw-off chutes, one for hopper cars and the other for box cars, the latter being loaded by a Stephens-Adamson portable box car loader.

Dust is minimized throughout the drying and screening buildings through use of an efficient dust collection-fil-

(Continued on page 116)



Predetermining counters used in car loading; left, stamp weight on delivery ticket

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New CAT* No. 9 Ripper

FOR THE

Mighty D9!

First choice for push-loading, the D9 is now more versatile than ever. The new No. 9 Ripper lets the D9 rip tough or frozen material between loading cycles. Faster, easier scraper-loading cuts time and costs.

TRACTOR-MOUNTED

The tractor-mounted No. 9 Ripper utilizes the weight of the D9 to force the teeth into hard material. No need for ballast or extra weights. The hydraulically operated ripper affords maximum maneuverability because it is tractor-mounted.

"LIVE DRIVE" HYDRAULIC PUMP

New No. 50 Hydraulic Control has a constant power pump that supplies the capacity to raise or lower ripper teeth *independently* of flywheel clutch or torque converter.

TWO RIPPING POSITIONS

Shanks may be pinned in either of two ripper positions which provide either maximum ground clearance when raised or maximum penetration (up to 28") when lowered.

TRIPLE TEETH

Use one, two or three. Any or all of them can be swung up and pinned out of the way. Teeth pivot 10° to either side. This permits tractor steering and smoother ripping through rocks. Shanks are heat-treated alloy steel, with hardened alloy cast steel boots. Points are hardened cast steel, *pin-attached* for easy replacement.

MANY OTHER IMPORTANT FEATURES!

Now the new No. 9 Ripper makes the "King of the Crawlers" an even more profitable and versatile machine. Mail the coupon for full details, or call your nearby Caterpillar Dealer. And remember, you can count on him for reliable service, and for parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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MODERN HEAVY-DUTY TRACTOR RIPPERS

MAIL TODAY!

Caterpillar Tractor Co., Dept. D-107, Peoria, Illinois

I would like more information on the new No. 9 Ripper

*Name*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

tration system. Nearly all facilities which generate dust are enclosed and vented to the filtration building; these include the driers, trommel and vibrating screens, bucket elevators, screw conveyors, and transfer points of belt conveyors.

The filtration unit is housed in a concrete building, which is served by six 90-in. New York Blower industrial fans, each driven by a 50-hp. G. E. motor. Dust-laden air enters the building via individual 24-in. or 30-in. steel pipe ducts, and is drawn up through a 14-20-in. coke filter bed which is subjected to continuous water sprays from above. The filter bed is supported on a wooden grate-platform (having 2- x 4-in. openings), which is installed about 2 ft. above the floor. The resulting dust slurry is drained through a pipe line to an adjacent settling basin, and the clean air is exhausted by the large fans to atmosphere.

The Portage plant is one of six operated by the company; the others are located at Dunes Park, Ind., Michigan City, Ind., and Sawyer, Mich. (all lake sand operations); Essex, Ill. (bank sand), and Festus, Mo., (silica sand). The latter operation was purchased in 1953.

The company headquarters and research laboratory are located at Rockton, Ill. Officers are Karl O. Geng, president; Thomas M. Manley, vice-president; Lois Manley Nelson (former wife of Dwight Manley, co-founder of the original company) secretary; Wm. P. Chadwick, treasurer and sales manager; and James S. Brophy, assistant secretary. Elmer Horton is general superintendent of all plants, and Ed Houk is superintendent of the Portage plant. Sales of the six operations are handled through the Manley Sand Co., which is also headquartered at Rockton.

HEAVY MEDIA

(Continued from page 106)

Goleta, San Luis Obispo and Santa Maria and black top plants at Santa Paula, El Rio and Santa Maria are also operated.

President of the company is T. M. Evans who is also president of H. K. Porter Co., Inc., Pittsburgh, Penn. Phillip E. Holmes is vice-president and general manager. Nicholas Savage is general manager of the northern division, and Milton F. Masters is general manager of the southern division. The H. K. Porter Co., Inc., is a holding company controlling Quaker Rubber Co., Leschen Wire Rope Co., Laclede Christy Co., and other companies serving various divisions of the rock products industry.

Inland Cement

(Continued from page 98)

circuits, contains start-stop buttons for all units (which are interlocked), ammeters for main motors, and schematic flowsheets with blinker lights for all facilities.

Each finish grinding circuit is vented to a 5-ft. scalping cyclone collector followed by a Sly 20 A Dynaclone dust collector, which has a back blower for cleaning the bag filters. A Canadian Sirocco fan (25-hp. drive) supplies 16,000 c.f.m. of air to the system. About 60 percent of this air is circulated through the separator for cooling purposes, the balance serving the mill and conveying units. Dust collected in the Dynaclones is discharged continuously by gravity to the cement pumps, while the coarser particles collected in the cyclones are returned to the mills for regrinding. The mill building is equipped with a 10-ton Dominion Bridge overhead service crane. In the present expansion program, a third complete grinding circuit is being installed.

The packing station, designed for rapid loading of bulk or bagged cement to rail or truck, incorporates six 24-ft. dia. silos, each holding 7500 bbl. The silos are arranged in two rows of three each, with bulk trucks being able to drive through; each silo has a conical steel bottom (55 deg. slope) with three Fuller rotary valve outlets. Each row of silos is served by a 14-in. FH Airslide conveyor delivering bulk cement to rail cars on a siding to the south of the packhouse, and by a 10-in. FH Airslide conveyor leading in the opposite direction to the bagging department. The third gate on each silo is used for bulk truck loading, the cement dropping by gravity through a telescopic chute to the truck; the chute is controlled by an electric hoist. Thus, this flexible arrangement permits cement from any silo to go to the packer or to bulk truck or rail loading. For loading bulk rail cars, the 14-in. Airslide discharges to a short swivel Airslide, which is pivoted via a circular monorail.

In the bagging operation, cement is taken from the 10-in. Airslide by a bucket elevator to a 36-in. screening screw, then into a cement bin mounted above the St. Regis 4-tube packer. High and low level Bindicators in the cement bin and in the packer surge bin automatically control the flow of cement to the packer. Operating at 50 t.p.h., the bagging machine discharges to a 30-in. reversible conveyor, from which the bags are taken by a live roller conveyor at either end to an extendable 30-in. truck-loading conveyor, 30-ft. centers. The latter is operated by a push button control at the discharge end. For loading bagged cement to rail cars, the live rollers are reversed, and the bags transferred to the rail siding by means of a 30-in. conveyor, 100-ft. centers, followed by a short spiral chute.

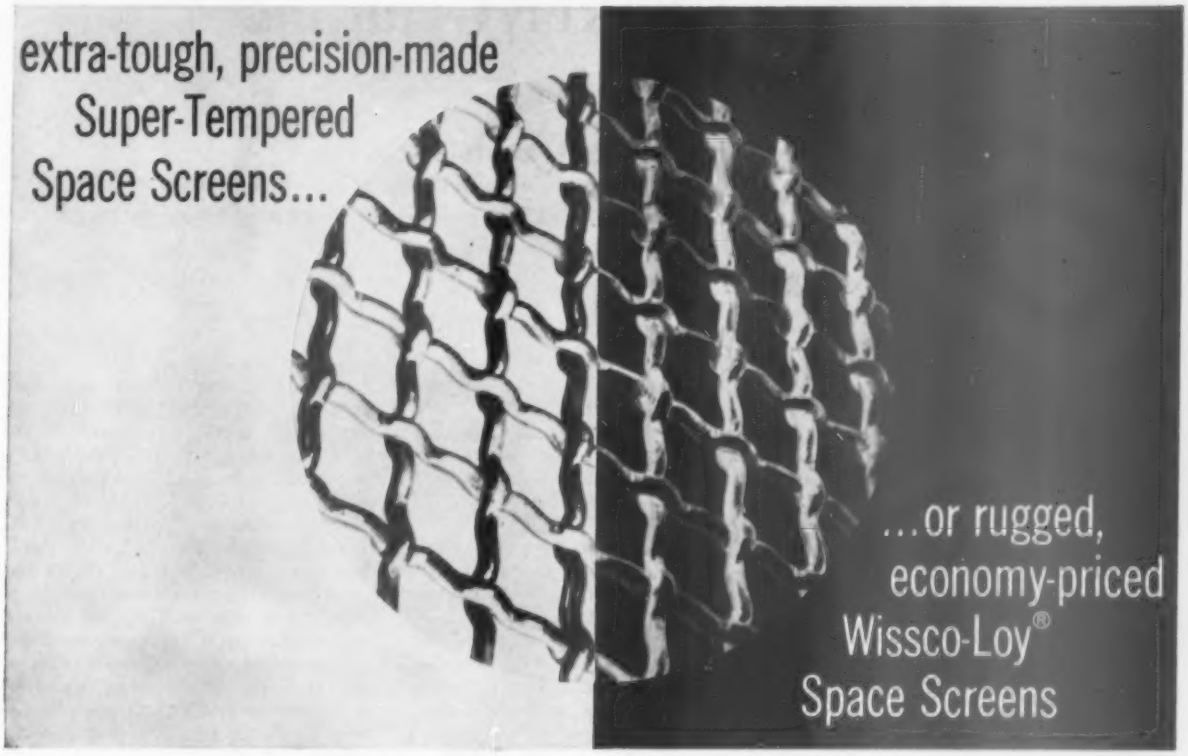
To prevent the multiwall bags from cracking during the cold dry winter months, the company has provided a humidity room above the packer, in which bags are stored for seven days. Spiral chutes are then used to transfer the bags to the bagging machine operator; a turntable for bags is available at the packing station.

Two dust collectors, each with a capacity of 7000 c.f.m., are used at the packhouse. One unit—a Sly Dynaclone—vents the bagging machine and related facilities; the other—a Sly bag-type filter—serves the silos. A screw conveyor under the bagging machine and the two live roller conveyors returns cement spillage to the packer elevator. Collected dust is also returned to the circuit. Truck loads are weighed on a 125,000-lb. Fairbanks Morse Printomatic scale; the bed is 12- x 72-ft. in size. Presently the company is adding six silos and two St. Regis packers to accommodate the doubling of capacity.

The Inland plant was designed and constructed under the supervision of Cimenteries & Briqueteries Reunies; and Foundation of Canada Engineering Corp., Ltd., Montreal, in conjunction with R. M. Hardy and Associates, consulting engineers, did the detailed engineering and assisted in supervising construction. Burns & Dutton Concrete & Construction Co. of Edmonton was the general contractor. All elevators and conveyors were supplied by Jeffrey Manufacturing Co., Ltd. Electric motors and controls were furnished by Westinghouse Electric Corp., Ltd.

Officers and key personnel of Inland Cement Co., Ltd. include the following: F. E. Notebaert, chairman of the board; W. L. Forster, C.B.E., president; William S. Ziegler, executive vice-president; Frank L. Day, secretary-treasurer; George Ross, sales manager; Arnold P. Robinson, plant manager; S. Leclipteau, plant engineer; Fred Ernst, production superintendent; Vlod Chaly, chief chemist; Andy Wilson, assistant production superintendent; and M. T. Pero, quarry superintendent (at Cadomin). Norman Edgar, Edmonton, serves as consulting geologist for the company.

which best suits your needs?



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Super-Tempered Space Screens are made from oil tempered wire that is crimped to precision standards and woven extra tightly to maintain accurate, uniform spacing *resulting in the lowest cost-per-ton screening under the severest operating conditions.*

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There's a very simple way to find out which of these attractively-priced space screens is best for your own job. Just contact your nearby CF&I representative; he'll be happy to give you the complete story on both extra-tough, precision-made Super-Tempered and rugged, economy-priced Wissco-Loy Space Screens.

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Cement Cooling During Clinker Grinding

FIVE CEMENT PLANTS

. . . have tested an air-cooling system which reduces temperature of finished product 25 to 30 deg. below cooling effected by older method

By E. R. KOLB*

AN AIR-COOLING SYSTEM, tested in five cement plants, now makes it possible to reduce the temperature of the finished product 25 to 30 deg. F. below the cooling obtained by air separation method without ventilation.

In the new system, relatively cool air is drawn into the separator and the same amount of hot air is exhausted through a dust collector. The air-cooling method is designed to keep cement temperature low in the finished product and to prevent temperature from rising dangerously throughout the system.

Since a major part of the energy used in grinding is converted into heat, the cement leaving the finish mill, or the fines leaving the air separator, will sometimes attain a temperature which is undesirable because of its effect in gypsum dehydration and ball coating. A way of lowering the cement temperature is often of prime concern to mill operators because of imposed temperature limitations in specifications.

The data presented in this article, collected during 1953, are concerned primarily with the reduction of the cement temperature by an air cooling system. The principle of this system consists of introducing atmospheric air into the inner cone of an air separator and discharging the heat-laden air from the outer cone of the separator into a dust collecting system. As a result of the liberation of heat from the ground clinker, the separator fines and tailings are discharged at a reduced temperature. The degree of temperature reduction of both the fines and the tailings is directly proportional to the amount of atmospheric air drawn through the separator. The constant recirculation of the cooled separator tailings through the clinker grinding mill also tends to lower the temperature inside the mill.

Data covering the installation of a cement cooler have been included to illustrate the cooling effects obtained with this type of cooling system.

Tests in five plants have proved that air cooling of cement in the separator is beneficial to the plants reporting their experiences. Although some cooling of the separator products is possible without additional air cooling, test data indicate additional reduction of 25 to 30 deg. F. with air cooling.

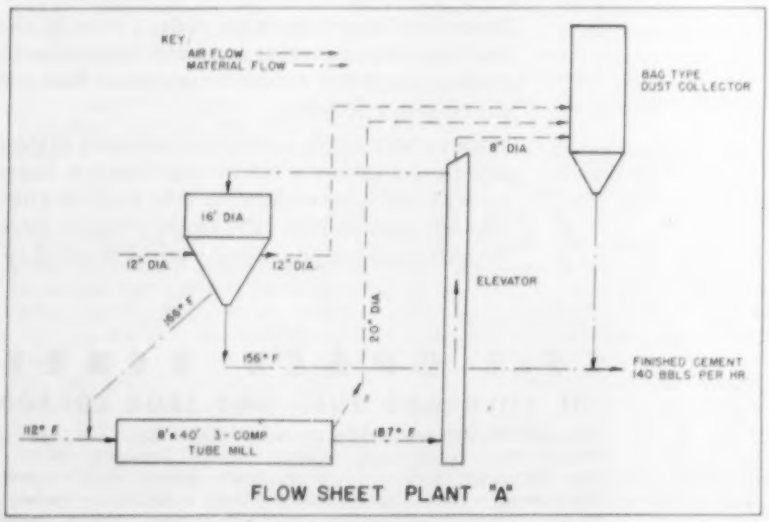
Air cooling lowers the temperature of the separator tailings as well as the fines. The constant recirculation of the cooled tailings through the mill also tends to lower the temperature inside the mill.

With respect to location of separator in the circuit and type and size of mills, the circuits are not standard for all plants.

If a low temperature of the finished cement is the only object, a greater degree of cooling may be obtained by the use of a cement after-cooler. However, air cooling in the separator makes it possible to keep the temperature of the product below the critical range throughout the grinding system.

In plant "A" an 8 x 40-ft. three compartment finish mill is closed-circuited with a 16-ft. air separator. (See flow sheet). The mill system also is equipped with a bag type, six-compartment dust collector which is connected to the air separator. The dust collector also has pickup pipes to the mill discharge and to the clinker elevator.

The dust collector consists of six 5-ft. compartments, thus a total length of 30-ft. There are 78 6-in. x 8-ft. 3-in. long bags in each compartment, resulting in a total of 468 bags with a cloth area of 5616 sq. ft. Automatic air shaking is used for removing dust from the bags. The collector is



FLOW SHEET PLANT "A"

*Process Engineer, Portland Cement Assn., Chicago, Ill.

1947 . . . the Barber-Greene Loader photographed when it started cutting costs for Lake Shore Sand & Stone Co. in Milwaukee.

1956 . . . the same loader still going strong after nine years of hard use . . . still saving loading time and costs.

"Our Barber-Greene has loaded a half million tons with no appreciable wear!"

H. F. Runkle, Vice President, Lake Shore Sand & Stone Co., Milwaukee

In his 40 years' experience in the sand and gravel business, Mr. Runkle reports that "nothing can equal a Barber-Greene for stockpile loading."

"We bought our newest B-G Loader back in 1947. Since then it has handled more than 50,000 tons a year with no major repairs and no appreciable signs of wear. We plan to get another 82-A this year to replace our oldest Barber-Greene which has been in continuous service since 1936."

Good design and rugged construction make it difficult to wear out Barber-Greene Loaders. Year after year they provide the cheapest and easiest way to load trucks from stockpile, bank or windrow. Crawler mounted for sure footing, the versatile loader handles bulk materials in one continuous, high-capacity flow. Easy to operate controls let drivers load their own trucks and reduce costly waiting time.

Other Barber-Greenes include the 543 Pneumatic-Tired Loader with swivel conveyor, and the 550 Windrow Loader.

Write for literature on any model in the cost-cutting loader line

56-19-BL

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

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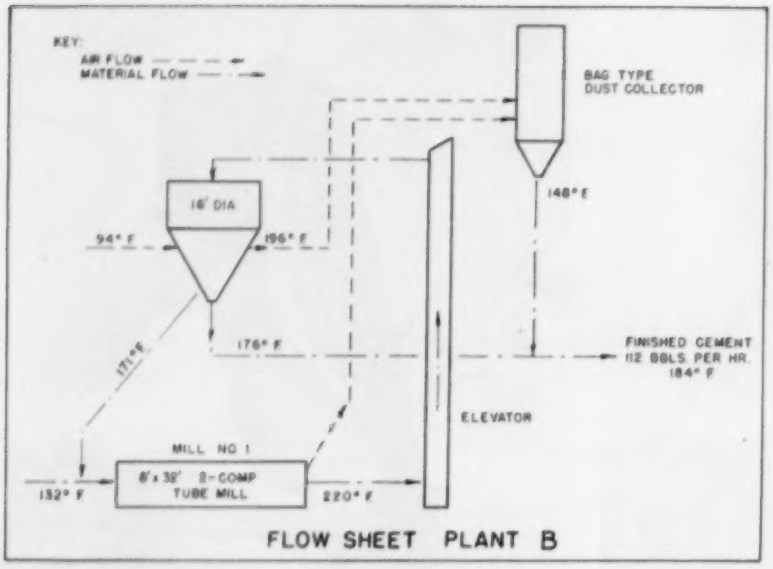

FLOW SHEET PLANT B

equipped with a fan driven by a 40-hp. motor through a V-belt drive. The fan has a capacity of 15,000 c.f.m. and discharges into the atmosphere. The pickup pipes consist of two 12-in. dia. pipes connected to outer cone of the air separator diametrically opposite, a 20-in. dia. pipe connected to mill discharge hood, and an 8-in. dia. pipe connected to elevator casing.

Since plant A was a new installation, there is no available data for comparison of operation without the dust collector cooling. However, the results of a recent test run in which the pipe connections to the air separator were blanked off, are given below. The collector still operated with the connections to the elevator and mill discharge open, so some cooling probably resulted from these conventional pickup points—but a true indication of the cooling effect resulting from the air separator is given.

	With Dust Collector Blanked off	With Dust Collector Connected
Room temperature	71 deg. F.	70 deg. F.
Clinker temperature	116 deg. F.	112 deg. F.
Mill discharge temperature	205 deg. F.	187 deg. F.
Separator fines	181 deg. F.	156 deg. F.

At the time of the tests, the mill was grinding Type I cement to a Wagner surface area of about 1725 sq. cm./gr. (Blaine fineness—3140 sq. cm./gr.) at a production rate of 140 bbl. per hr.

A few tests were made later with the circulating load varying from 100 percent to 400 percent. The temperature of the separator rejects was about 10 deg. higher than the finished cement temperature with the dust collector connected and 15 deg. higher with the dust collector blanked off.

The discharge from the dust collector, added to the finished cement, is included in the production rate of 140 bbl. per hr. The finished cement temperature was measured at the separator discharge, and thus did not include any effect due to the dust.

With the cool clinker at this plant, the reduction in the finished cement temperature (25 deg.) is not as great as might have been expected or as previously reported by others. It is expected that as the clinker temperature increases, the effectiveness of the air separator-dust collector installation would increase.

No attempt was made to evaluate any increase in mill capacity during this short test due to cooling, but it is expected that some increase has resulted due to cooler operating temperatures throughout the system.

Preformance of bag-type dust collector at plant "B" confirmed the design expectations and the results from similar installations. The amount of cement collected by this installation amounts to nearly 85 grains per cu. ft., which confirms previous experience.

The data on plant "B" represent fairly normal operation. The actual grinding capacity in the three mills has been approximately 112 bbl. per hr. per mill. The dust temperature and the cement dust accumulated by the collector are also shown following the data for each mill. When the separator cooling system is used, the cement dust is cooled more than the separator fines. During the test the collector dust was run out to a large tarpaulin so that the dust gathered in 15 minutes could be weighed and the temperature recorded. The material may have been slightly cooler under these conditions than it would have been under normal operation in a closed system.

The collector dust and the separator fines are pumped to the silo warehouse. In the tests, sufficient time was allowed so that the system approached equilibrium. Since equilibrium may not have been obtained in some tests, the temperature shown for the separator fines may have been influenced by unusual draft conditions when the air vents were either opened or closed.

The average temperature at the cement pump has been slightly higher than the temperature of the separator fines, probably due to the method of securing temperature readings for the separator fines. (See table on page 122)

Cooling cement by air flow through the air separator in a closed circuit grinding system has proved satisfactory in plant "C." During the summer, product temperature was held to about 224 deg. F. in the grinding of standard air-entraining cement. The clinker feed temperature was about 218 deg. F. and the cool air supply was 116 deg. F. The system has required little maintenance. Power requirement is about 6 hp. for a production of 120 bbl. per hr. No tests of the system's effect on separator efficiency have been conducted. It is doubtful that the effect is significant.

The clinker grinding system (diagram, plant "C", page 124) consists of two 9 x 15-ft. ball mills in series. The product from the second mill is fed to an 18-ft. air separator. Rejects are returned to the primary mill feed stream. A single blower draws cooling air through the separator, and collects dust from both ball mills and all conveying equipment between mills, separator feed, and reject return. This blower, driven by a 40-hp. motor, is rated 18,000 cfm, 31.5 bhp, and 900 sq. in. intake (total). The duct drawing the separator cooling air has an area of 157 sq. in.

By proportion:

$$\frac{157 \text{ sq. in.}}{900 \text{ sq. in.}} \times 18{,}000 = 3140 \text{ c.f.m. cooling air}$$

$$\frac{157 \text{ sq. in.}}{900 \text{ sq. in}} \times 31.5 \text{ bhp} = \text{about 6-hp. net power requirement for cooling system}$$

Dust from the two ducts goes to separate bag type collectors and is discharged into the finished cement stream. Efficiency tests were conducted in the summer of 1951. Temperature records were made with a record-

(Continued on page 122)

It's time to compare . . . with LINK-BELT SPEEDER

Link-Belt Speeder gives you up to

40% more usable horsepower

greater line pull . . . bonus power to dig, hoist, swing, travel

Link-Belt Speeder machines are built to take full advantage of the "bonus" horsepower available in shovel-crane engines!

SIZE for size, a Link-Belt Speeder gives you more *usable* horsepower. You get more line pull, more power at the bucket teeth . . . more power to swing, hoist and travel. That's because a Link-Belt Speeder takes more power out of its engine!

You see, a Link-Belt Speeder is built with extra strength—strength to handle greater horsepower. Thus, the engine in a Link-Belt Speeder can be (and is) set to deliver the greater horsepower for which the machine is designed. Link-Belt Speeder gives you a bonus of up to *40% more usable horsepower than machines using the same make and model engine!* And, in every instance, the engine in a Link-Belt Speeder is run at speeds well within the manufacturer's recommendations.

How to compare

Your Link-Belt Speeder distributor will furnish complete specification information. Check sizes and materials in Link-Belt Speeder shovel-cranes that allow you to use the actual horsepower you are paying for. LINK-BELT SPEEDER CORPORATION, Cedar Rapids, Iowa.

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Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

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ing potentiometer. Averages for each shift were determined by graphical integration. These are averages of four shifts:

Product	Type I-A, portland cement
Production	189 bbl. per hr.
Circulating load	914 percent
Separator feed temp.	242 deg. F.
Reject temperature	235 deg. F.
Finish cement temp.	224 deg. F.
Cool air supply	116 deg. F.
Clinker feed temp.	218 deg. F.

Assuming a specific heat of 0.186 for cement, 11,500 B.t.u. per min. were removed from the separator feed with a "cool" air supply temperature of 116-deg. F.

Nearly 3.75 bbl. of fines per hr. were taken out of the separator by the cooling system and sent to the product stream. This is about 0.3 percent of the separator feed; however, this has not been studied.

Tests in plant "D" 's grinding installation have proven that a high circulating load (approx. 400 percent) is the most efficient in regard to output. Operating the air separator in closed circuit with both mills in series and returning the tailings to ball mill, according to the studies, result in lower temperature of the finished cement. This operating information shows the result of this grinding circuit:

Temp. deg. F., tube mill product	240
Temp. deg. F., sep. fines	221
Output, bbl. per hr.	223.5
Fineness, ball mill product percent passing	325 Mesh, 65.3
Fineness, sep. tailings	325 Mesh,58.4
Fineness, sep. fines	325 Mesh, 92.5
Circulating load	325 Mesh, 395 %

Tests were made when the grinding circuit was operating in the standard way with the preliminary mill in open-circuit and the tube mill closed-circuited with the air separator. The production rate was approximately 190 bbl. per hr. through the system. The circulating load was 125 percent. The principal elements of this system are: (1) a 10½ x 15-ft. ball mill, (2) an 8 x 32-ft. tube mill (single compartment) and (3) a 100-hp. 16-ft. separator.

The quantity of air being drawn through the separator by the collector unit was not obtained in this test.

The temperatures were.

1. Clinker feed	177 deg. F.
2. Ball mill product	230 deg. F.
3. Tube mill product	265 deg. F.
4. Separator tailings	195 deg. F.
5. Separator product	225 deg. F.

In conjunction with grinding rate studies, another series of tests was made to determine the cooling effect of the dust collector—air separator combination. (See flow sheet). Three tests were run. In the first, the ball mill was closed-circuit, tube mill open circuit, high circulating load, with separator vented to collector. In the second test, the circulating load only was varied—from high to moderate. For the third test, with a moderate circulating load, the separator was disconnected from the collector. Equipment characteristics are: separator—100 hp., 16-ft.; collector—25-ft., five compartment, 25-hp., 8400 cfm, 390 cotton filter bags, 4680 sq. ft. The temperatures, feed rates, and circulating loads follow on page 124:

Temperatures (deg. F.) of grinding circuits

Mill No. 1, Air Vents Open

	8 A.M.	9:30	11:00	12:30	Avg.
Clinker	126	132	136	134	132
Mill discharge	226	214	214	224	220
Separator fines	168	176	178	182	176
Separator tails	166	164	166	186	171
Collector intake	190	202	196	194	196
Collector exhaust	164	170	162	170	167
Cement pump	184	186	182	184	184
Air in mill bldg.	94	96	96	88	94

Dust collected—2731 lb. in 15 min. or 29.04 bbl./hr. temp. of dust from collector—148 deg. F.

Mill No. 1, Air Vents Closed

	2 P.M.	3:30	5:00	Avg.
Clinker	138	136	126	137
Mill discharge	230	228	232	230
Separator fines	198	198	210	202
Separator tails	208	209	208	208
Collector intake	200	196	202	199
Collector exhaust	160	162	167	163
Cement pump	202	205	202	203
Air in mill bldg.	94	94	96	95

Mill No. 2, Vents Open

	8 A.M.	9:30	11:00	12:30	Avg.
Clinker	136	132	144	142	139
Mill discharge	220	222	216	224	221
Separator fines	172	176	168	172	173
Separator tails	182	176	164	170	173
Collector intake	198	196	196	202	198
Collector exhaust	162	166	162	172	166
Cement pump	184	186	182	184	184
Air in mill bldg.	94	96	96	88	94

Dust collected—2449 lb. in 15 min. or 26.08 bbl./hr. Temp. of dust—158 deg. F.

Mill No. 2, Air Vents Closed

	2 P.M.	3:30	5:00	Avg.
Clinker	148	148	140	145
Mill discharge	230	234	234	233
Separator fines	204	204	196	201
Separator tails	214	210	216	213
Collector intake	202	187	192	194
Collector exhaust	158	162	167	162
Cement pump	202	205	202	203
Air in mill bldg.	94	94	98	95

Mill No. 3, Air Vents Open

	8 A.M.	9:30	11:00	12:30	Avg.
Clinker	146	126	152	140	141
Mill discharge	216	212	214	222	216
Separator fines	186	188	183	178	184
Separator tails	176	186	179	170	178
Collector intake	210	198	194	198	200
Collector exhaust	162	162	160	168	163
Cement pump	184	186	182	184	184
Air in mill bldg.	94	96	96	88	94

Dust collected—2083 lb. in 15 min. or 22.16 bbl./hr. Temperature of dust—152 deg. F.

Mill No. 3, Air Vents Closed

	2 P.M.	3:30	5:00	Avg.
Clinker	146	144	142	144
Mill discharge	226	232	230	229
Separator fines	206	204	204	205
Separator tails	208	210	210	209
Collector intake	196	180	210	195
Collector exhaust	160	160	163	161
Cement pump	202	205	202	203
Air to mill bldg.	94	94	98	95

Air Volumes, Weight and Btu to and from Collectors

		Volume c.f.m.	Weight, lb. per min.	Btu per min.
Mill No. 1	Intake	11,520	694	18,950
	Exhaust	13,400	865	20,130
Mill No. 2	Intake	12,720	764	21,390
	Exhaust	13,600	878	20,280
Mill No. 3	Intake	12,120	750	20,230
	Exhaust	13,550	875	19,960

EQUIPMENT

Three 8 x 32-ft. two-compartment mills
Load first compartment: 36,000 lb.—3-in., 2½-in., 2-in. balls
Load second compartment: 104,000 lb.—1½-in., 1¼-in., 1-in., ¾-in. balls

800 hp. a.c. synchronous motor—Developed 865-hp. during test

Elevator	15 hp.	
Screw to separator	15 hp.	
Separator	100 hp.	30 aux. blades—Valves 1½-in.
Collector fan	50 hp.	
Air slide	5 hp.	
Panfeeder	3 hp.	

Dust Collector

No. compartments	6
Size	30-ft. x 8-ft. 6-in.
No. of bags	468
Size of bags	6-in. x 8-ft. 3-in.
Filter area	5,616 sq. ft.
Fan rating	13,000 cfm at 8-in. static pressure
Temperature range	150 deg.—180 deg. F.

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One of the nation's major sources of titanium, this open-pit has produced 15,000,000 tons of ilmenite-magnetite ore and 8,700,000 tons of concentrates since its start in 1942. Over 17,000,000 tons of rocky overburden have also been removed. Entire deposit is 1800 ft. long, 900 ft. wide; averages 35% magnetite, 32% ilmenite, 10% feldspar and 23% iron silicates. All ore and waste must be shot...drill holes are sunk with a 42-T churn drill using a 9 inch bit, to 39 ft. deep. From 350 to 500 lbs. of 90% gelatin dynamite are used per hole...each lb. breaks up 3½ tons of waste and ore. A 4-yd. shovel, together with four 22-ton rear-dump trucks, loads all waste ...two 2½-yd. shovels, together with seven 15-ton trucks, move the ore. Finished ilmenite goes to processing plants, for conversion into titanium dioxide pigments for paints, paper, rubber, ceramics, and other substances. Magnetite concentrate is both converted to sinter and shipped raw to various iron, steel, refractory, and cement plants.

How rubber-tired tractors cut costs for one of world's largest titanium mines

In the heart of the Adirondack Mountains in upper New York State lies a mine which is one of the world's largest producers of titanium. From a pit 900 ft. x 1,800 ft. comes 3,200,000 tons of ore and waste yearly. Two rubber-tired Tournatractors shuttle back and forth to handle tractor work at pit, stockpiles, and plant.

1 tractor cleans around 3 shovels, 1 dropball, 11 trucks

One of these 17 mph 208 hp units is assigned mainly to pit and dump clean-up. At the pit, it cleans around *two* 2½-yd. shovels, *seven* ore-hauling trucks, *one* 4-yd. shovel, *and* a rubber-tired dropball crane. At the dump, a mile away, it cleans up for a fleet of 4 end-dump trucks. Rig shuttles continuously between assignments. A 300 ft. trip between shovels takes as little as 20 seconds ...the mile from pit to dump takes 3 to 5 minutes. Despite this busy schedule, tractor finds time to move air compressors, drills, and other pieces of pit equipment.

Another dozes magnetite weighing 4800 lb./yd.

The second Tournatractor is used primarily on the magnetite stockpile. Here it dozes concentrate within range of clamshell that loads railroad cars, or else dozes directly into a hopper. Rig's blade often carries 2½ cubic yards of material — weight *6 tons!* When needed, this tractor moves to other stockpiles to doze ilmenite concentrate or coal. Occasionally, it spots railroad cars in the sintering plant area. As needed, it cleans spillage from roads and haulage ways, and does other odd jobs. Wherever it goes, rig's low-pressure tires do no damage to footing. They roll easily over pavement, railroad tracks and ties.

Each costs $1 less per hour to operate than crawler-tractors

On shovel clean-up jobs, owners report Tournatractors outproduce the biggest crawler-tractors, 2-to-1. Units usually work at higher speeds and move job-to-job at higher speeds. Tournatractors cost less to maintain, too...4 tires eliminate the headaches of 500 to 600 track parts. Lowered maintenance, plus lower repair and operating costs are proved by accurate figures kept by the mining company. These show cost to operate Tournatractor "averages" approximately *$1.00 less per hour than their records of average cost for crawler-tractors.*

You judge its advantages

Tournatractor's lower costs, "go-anywhere" mobility, and fast-working speeds can pay off for you, too! Ask your LeTourneau-Westinghouse Distributor for a demonstration of this versatile machine so you can judge its advantages for yourself!

Tournatractor—Trademark Reg. U.S. Pat. Off. T-752-M-bw

▼ Dozing stockpiled magnetite, Tournatractor moves up to 2½ bank yards (about 6 tons) per push.

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

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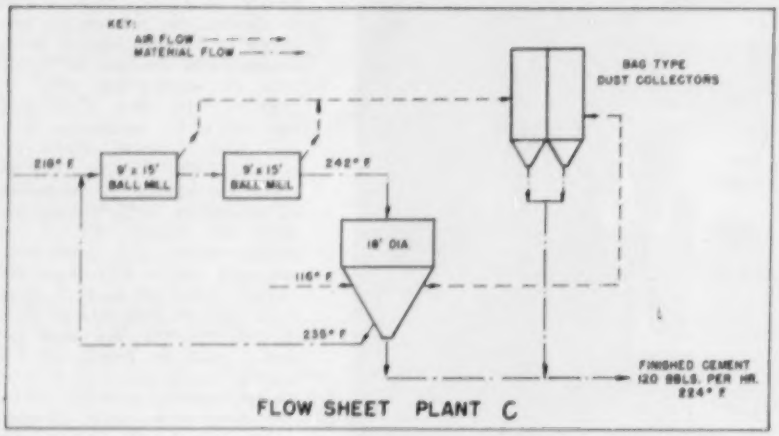

FLOW SHEET PLANT C

Temperatures, deg. F.	Test I	Test II	Test III
Clinker	177	172	172
Ball mill product	214	216	218
Separator tails	205	187	202
Separator fines	194	185	185
Tube mill product	261	244	248
Mill room	79	76	76
Feed Rate, lb./min.	1316.0	1288.1	1288.1
Feed Rate, bbl./hr.	209	205.5	205.5
Finenesses		Percent Passing	
Ball mill prod. 200M	28.9	45.5	46.3
Ball mill prod. 325M	22.2	37.2	37.8
Separator tails 200M	16.4	21.9	20.4
Separator tails 325M	10.4	15.3	14.5
Separator fines 200M	80.3	84.6	82.7
Separator fines 325M	63.3	70.0	66.1
		Percent	
Circulating Load 200M	410	165	140
Circulating Load 325M	350	150	120
Circulating Load Avg.	380	158	130
Cooling Equivalent Btu/bbl.	54.1	76.7	51

The difference in cooling equivalent between tests I and II is due to overloading of the air separator, which reduces the volume of air drawn through the separator. The cooling accomplished in test III is due to radiation and venting of the separator indirectly to the dust collector via Air Slides.

The tabulation on page 128 for plant "E" gives the data taken at the various locations in the clinker grinding circuit where cooling devices have been applied: (See Flow Sheet)

These figures are the average of readings taken at the various points and are typical of average operating conditions.

In Fig. 1 the temperatures have been plotted for the various stages of clinker grinding in two plants. Plant "E" uses a cement cooler for reducing cement temperature, while plant "B" uses the principle of air cooling in the separator. These plants were selected on the basis of having approximately the same clinker feed temperatures and production rates, to show cooling effect of the two systems.

From the plot it is apparent that the temperature reduction through the cement cooler (71 deg. F.) is much greater than the reduction gained by air cooling (48 deg. F.)

(Continued on page 128)

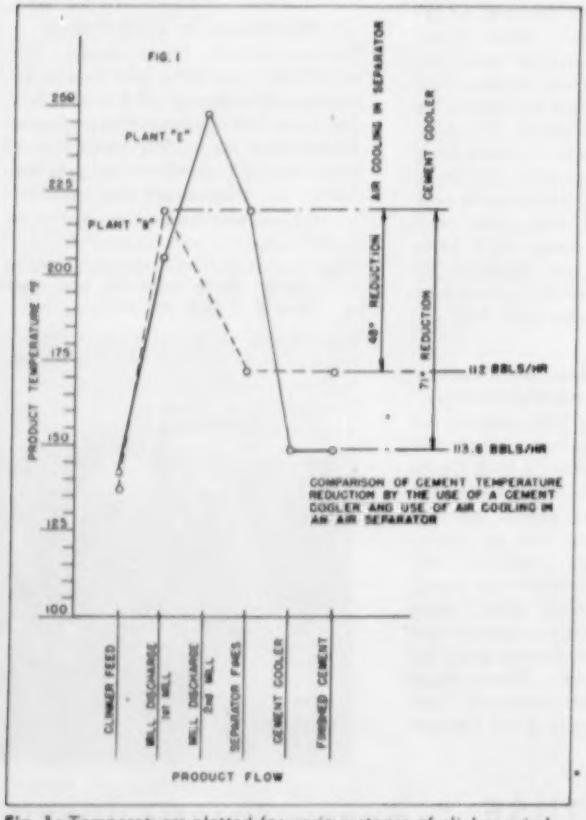

Fig. 1: Temperatures plotted for various stages of clinker grinding in two plants

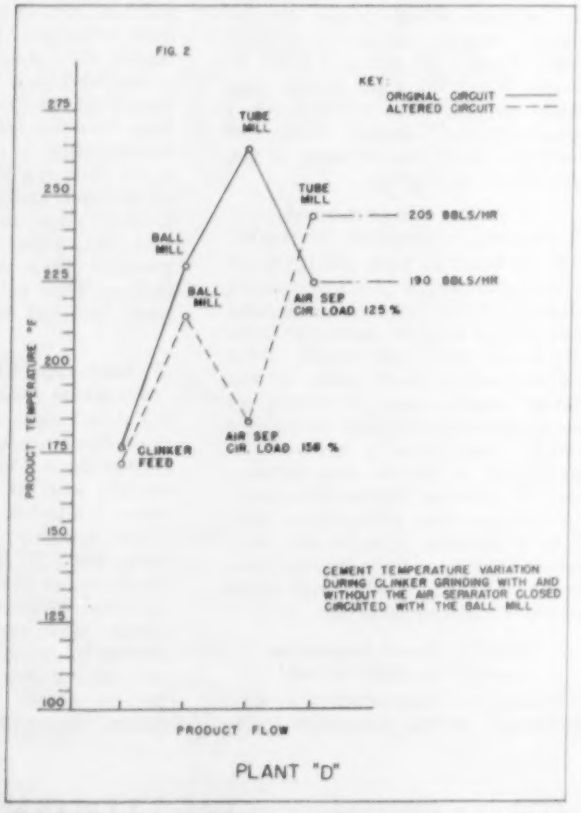

Fig. 2: Comparison of grinding temperatures for two different grinding circuits

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What about hydro-flation?

Hydro-flation increases weight of 208 hp, 31,700-lb. Tournatractor by nearly 10%. Increased traction and drawbar pull, plus decreased tire slippage and decreased tire wear are the results.

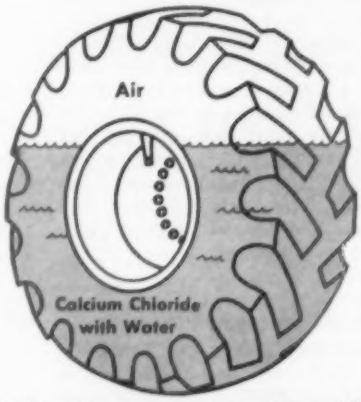
Water or "hydro-inflation" of farm and industrial tractor tires is an old and accepted practice. In the last few years, it has been tried extensively in self-propelled scrapers and big rubber-tired tractors, too. While all the benefits and possible faults are not yet known for dirtmoving uses, certain obvious advantages make it worth your careful consideration.

Measures weight and traction

Biggest advantage is that hydro-flation greatly increases the weight —and the traction—on drive wheels. For example, hydro-flation alone increases the weight of *one* 16-ply 21:00 x 25 tire — 700 to 1,400 lbs.

If you hydro-flate the 4 tires of a LeTourneau-Westinghouse Tournatractor in this way, you add up to 5,600 pounds to its working weight. Even allowing for greater rolling resistance (due to the added weight), your drawbar pull is increased by 3,100 lbs.

Hydro-flating the drive tires of other earthmoving equipment increases drawbar by similar margins. And, because the solution counterbalances as the wheel rotates, you lose practically no power on the haul. Hydro-flation also cuts slippage and tread wear, and reduces need for frequent re-inflation due to pressure loss.



With valve stem in top position, fill tire with solution up to level of valve stem. Tire will then be filled to within approximately 75% of capacity. Complete inflation to manufacturer's recommended pressure with air.

Calcium chloride prevents freeze-up

The liquid usually used for hydro-flation is either plain water or a mixture of calcium chloride and water. Because the calcium chloride readily dissolves, it has the advantage of increasing weight without increasing volume. The calcium solution will not freeze, even in sub-zero temperatures, and it will not injure rubber.

Simple to do

Hydro-flation is simple. First, thoroughly mix the calcium chloride with water. Follow recommendations of the tire manufacturer—usually three to five pounds of the chemical are added to each gallon of water. Next, jack up wheel of machine to remove all weight from tire. Then, rotate tire until valve stem is at top and perpendicular to ground. Remove as much air as possible. Attach nozzle of hydro-flater to valve stem. Remaining air will escape as solution is pumped in.

When solution reaches valve stem level, remove nozzle and inflate tire with air to manufacturer's recommended pressures. On construction equipment, tires should not be filled with liquid above 75% capacity. Valve should be at highest position when checking air pressure.

One word of caution if you use the recommended calcium chloride solution instead of just water . . . be sure to obtain tubes with special rubber-sealed base valves. This type valve will prevent separation of the rubber valve base and the metal. Special corrosion-proof gauge should be used for checking pressure, too. Equipment for the liquid inflation can be obtained from an agricultural implement dealer or any large tire distributor or dealer.

Tournatractor—Trademark Reg. U.S. Pat. Off.
G-740-OP-bww

Free copies of this article can be obtained by writing LeTourneau-Westinghouse Company, Peoria, Illinois. Please state quantity desired.

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A Subsidiary of Westinghouse Air Brake Company
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See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

EVERY LOAD A PAY LOAD

Not conversation, but FACTS: the KIESLER clam shell, using the *proven* principles of leverage and power—applied to both shells—has more "DIGGING-IN" ability than any other bucket made. Results are deeper penetration-on-every-trip regardless of the material being moved, and greater payloads.

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GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

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KIESLER

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Enter 1558 on Reader Card

FLEXIBLE GRAVEL PLANT

(Continued from page 92)

All plant facilities are operated on 440-v. current, with controls centralized in a concrete block building adjacent to the primary station. To facilitate starting and stopping the plant, the start-stop buttons are mounted in sequence according to the flow of material.

One man operates the entire plant facilities. Other operating personnel include a dragline operator, a pit truck driver, two stockpiling truck drivers, a truck loader, and the superintendent. All shipments are by truck and are weighed on a 30-ton 34-ft. Winslow scale. Loading from stockpile is handled by a Haiss bucket loader, a Wagner-mobile LD5 front end loader with 2-ton bucket capacity, and a Bucyrus-Erie 22B crane.

Recently the company moved its Sargents, Ohio, ready-mixed concrete plant to the Springfield site; this plant formerly served the Atomic Energy project at Sargents. Supplied by Erie Strayer Co., it incorporates a 212-cu. yd. bin providing for three sizes of aggregates and 425-bbl. of cement. Other facilities include a 5-cu. yd. aggregate batcher, a 36-cu. ft. cement batcher, and an 800-bbl. cement silo. Already available at the new plant site is a 30- x 60-ft. concrete block garage and workshop having five truck stalls.

Ellis D. Davis is manager of the General Materials Division, and Noble W. Harris, superintendent. Besides operating this division, New York Coal Co., headquartered in Columbus, Ohio, also operates three other Ohio divisions. These include Highland Stone Division (limestone quarry and ready-mixed concrete plant at Hillsboro); Plum Run Stone Division (limestone quarry and ready-mix plant at Peebles); and Basic Construction Materials Division. The latter includes sand and gravel, block, and ready-mix plants at Chillicothe, and ready-mix plants at Circleville, Waverly, and Ironton. The company also handles building materials at several plants.

Riverside Enlarges Plant

RIVERSIDE CEMENT CO., San Francisco, Calif., has begun enlargement of facilities at its Oro Grande plant (near Victorville), Calif. A contract for the work has been awarded to The Fluor Corp., Los Angeles, covering a 50-percent expansion of the finish cement producing facilities, new cement packhouse and two bulk loading stations.

The project, costing approximately $3.5 million, is scheduled for completion in July, 1957.

Low cost-per-pound steel liners?

Here's what happened when ordinary steel liners were operated in the same mill with ABK Metal liners. You can easily see the difference in wear in this photograph.

Low cost-per-ton ABK Metal liners?*

*Low cost per ton of material ground, of course. The slight additional first cost of ABK Metal is more than offset by its extra life, by reduced labor, by savings in equipment down-time.

ABK® METAL cuts cost 3 ways

1. ***Lasts longer*** . . . costs less per ton of material processed.
2. ***Slashes labor expense*** . . . of frequent liner replacement.
3. ***Prevents down-time*** . . . avoids costly losses in production.

Yes, three to four times normal life can be expected when ABK Metal replaces ordinary liners. That's because of its extreme hardness (500 to 700 Brinell) and very high resistance to abrasion. A controlled structure nickel-chrome iron, ABK Metal is produced *only* by American Brake Shoe.

AMERICAN Brake Shoe COMPANY

A-973

BRAKE SHOE & CASTINGS DIVISION
230 PARK AVENUE • NEW YORK 17, N. Y.

Enter 1607 on Reader Card

CEMENT COOLING

(Continued from page 124)

When cement temperatures approach a range during grinding where dehydration of the gypsum becomes a problem, it would be logical to find a means of reducing the temperature before it attains that range. Regardless of the varying degrees of heat generated within the mill during grinding to various finenesses, the maximum safe limit for any cement being ground, should be considered in refining the mill circuit to obtain a safe temperature range. Although plant "E" has been successful in cooling the cement after the grinding has been completed, this does not necessarily hold true for all plants.

The flow sheet for plant "D" illustrates a grinding circuit that limits the maximum temperature of cement in the intermediate stages of the grinding process. The air separator is used in the circuit between the two stages of grinding, a different method from the one normally used in the industry. In the usual procedure, the ball mill operates in open circuit followed by the tube mill in closed circuit with the separator. In both methods the separator products are air cooled. A comparison of the grinding temperatures for the two circuits is illustrated in Fig. 2.

The reversed slope of the dotted temperature line, following the ball mill discharge, illustrates the method of reducing the cement temperature before the product attained a temperature, which in this case, proved to be detrimental to the finished product. Even though there is a considerable rise in temperature in the tube mill when using the altered grinding circuit, probably because of the increased production, the finished product apparently does not reach the critical temperature for this plant.

It is reasonable to conclude that the cement had reached the critical temperature sustained in the tube mill in the orginal circuit and that after-cooling in the separator was of secondary importance.

The investigation carried out at plant "D" provides a basis for an application of air cooling the separator to lower the cement temperature during the clinker grinding process.

Fig. 3 illustrates the temperature reduction of cement during the period of classification in the air separator with and without the introduction of atmospheric air for cooling. The left column, for each plant, indicates the temperature of the separator feed and the fines without air cooling; the dust collector being blocked off. The right

(Continued on page 157)

TYPE I

	Feed Temp. F.	Discharge Temp. F.	Temp. Rise	Temp. Drop
Preliminary mills	196	215	19	
Tube mill	215	267	52	
Cement pumps feeding cement coolers	267	153		114
Cement pump to stock house	153	159	6	
Water trough enclosing conveying pipe, 150-ft. long	159	153		6
Preliminary mills—163.8 bbl./mill hr., each				
Tube mills—44.9 bbl./mill hr., each				

TYPE III

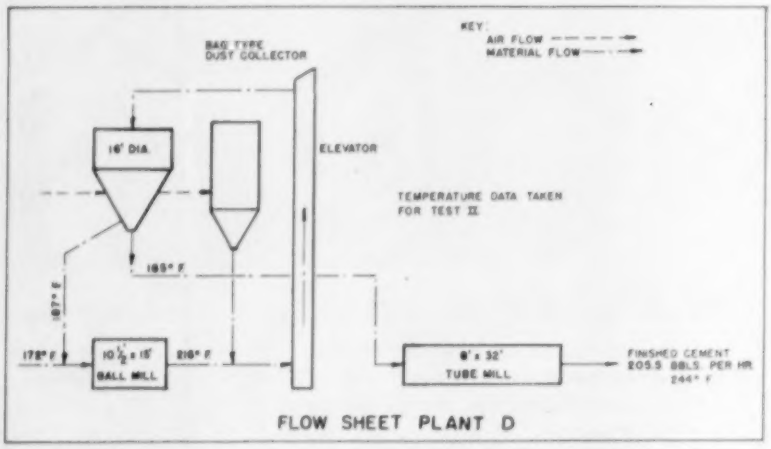
Preliminary mills	143	206	63
Tube mills	206	248	42
Air Separators	248	220	28
Cement coolers	220	149	71
Cement pump to stock house	149	156	7
Water trough	156	149	7
Preliminary mills—113.6 bbl./mill hr., each			
Tube mills—25.1 bbl./mill hr., each			

Type I. Water Temperatures deg. F.

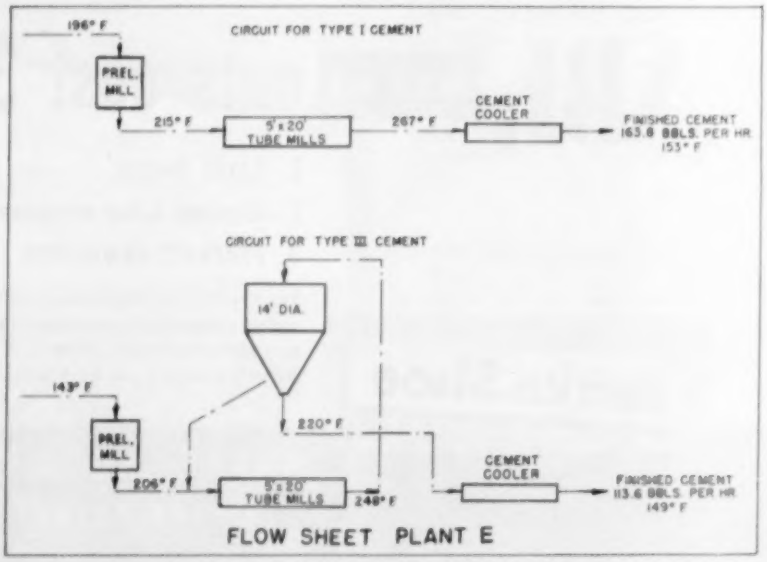
	Ent.	Leaving	Rise
Tube mills	56	83	27
Coolers	56	77	21
Cooling trough	58	65	7

Type III. Water Temperatures deg. F.

Tube mills	56	81	25
Coolers	56	73	17
Cooling trough	58	64	6
Gal./hr. on tube mills	6000 approx.		
Gal./hr. through coolers	6000 approx.		
Gal./hr. through trough	2000 approx.		



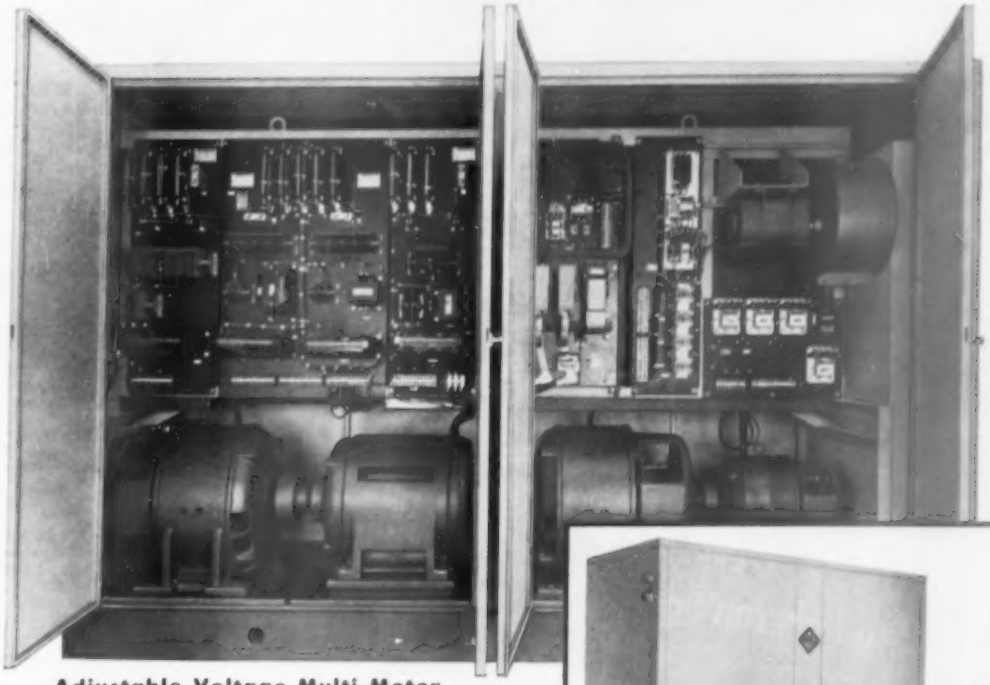
FLOW SHEET PLANT D



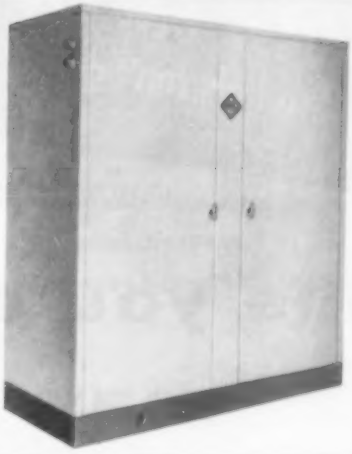
FLOW SHEET PLANT E

There's MORE dependable speed control

- high response
- high shock resistance
- no fragile parts
- no maintenance



Adjustable Voltage Multi-Motor Package Drive used with heat flattening and coating equipment. Unit features magnetic amplifier control of tension and strip speed.



Size 3 Adjustable Voltage Power Unit rated 30 hp, of standard construction. Magnetic amplifier excitation provided.

Every one of the design features of the Allis-Chalmers Adjustable Voltage Package Drive assures you an easy, dependable means of power conversion.

Key to Package Drive dependability is the use of a magnetic amplifier to excite the field of the power unit m-g set. Sturdy and simple, this amplifier has no moving parts to wear out . . . no fragile components to be affected by vibrations. AND — there's no wasteful "warm-up" time needed. At the turn of a dial, you get immediate speed control.

Cost-saving assembly

M-g set and control components are assembled in the power unit enclosure at the factory — saving you installation costs. Enclosures used for 30 through 200-hp units are completely collapsible and may be easily disassembled without loss of rigidity. Larger units have separately driven blowers to provide positive ventilation and pressure even when unit is idle.

Available in units from 5 to 200 hp, the package drive is ideal for any application requiring adjustable speed. Contact your nearby Allis-Chalmers sales office or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

A-5166

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AIR HOSE — B. F. Goodrich has published a bulletin on its line of air hose, including Maxecon All Purpose hose, Highflex, Type 50, Commander, and Type 88. Bulletin 3460 contains descriptions and specifications.

Enter 700 on Reader Card

AXEL ASSEMBLIES — United Manufacturing Co. has prepared a catalog describing two and four-wheel Caravan axle assemblies designed for use by manufacturers of mobile equipment. Photographs show the basic two-wheel and four-wheel designs. Construction details are illustrated.

Enter 701 on Reader Card

BITUMINOUS MIXING PLANT — Iowa Manufacturing Co. has issued a 12-page bulletin describing Model H15 bituminous mixing plant. Bulletin AP-23 gives complete specifications and details of the batch-type plant and information about each sectionalized unit. Also included are flow diagrams, description of simplified controls, and an explanation of easy erection features.

Enter 702 on Reader Card

BLOCK MACHINE—The Kent Machine Co. has brought out a new circular on the Kenthree Blockmaker plain pallet machine. Features of the electronic, hydraulic and mechanical automation units described are front pallet return, offbearing hoist, dimensional control, control cabinet, and heavy duty vibrators. Specifications are included, as are illustrations of other machines in the Kent line.

Enter 703 on Reader Card

BULK CEMENT HANDLING — Fuller Co. has announced Bulletin FK-27 on bulk cement handling in New York Harbor. Information is given on the Fuller-Kinyon pumping system which pumps cement aboard a barge. The bulletin explains the complete system, including loading and unloading procedure.

Enter 704 on Reader Card

CASTABLE REFRACTORY MATERIALS —Plibrico Co. has issued a new catalog covering its complete range of Plicast castable refractory materials. A description of each type of material is given and uses for each of the 13 grades are suggested.

Enter 705 on Reader Card

CASTINGS—American Brake Shoe Co. announces Bulletin J-4267, "Amsco Manganese Steel Castings", containing representative applications for the castings, including dippers and back-hoe buckets, mill liners, hammers, jaw plates, wheels, rollers, sheaves, gears, chain, dredge buckets and dredging screens. Also described briefly are Amsco Dredge Pumps, parts and fittings, Amsco Weldments and Hardfacing Alloys.

Enter 706 on Reader Card

CENTRALIZED LUBRICATION — The Farval Corp. has issued Bulletin 101 describing the application of Farval centralized lubrication to mechanical equipment in the cement and quarry products industries. The booklet contains information on increased production at lower costs. Case studies and actual application photographs are included.

Enter 707 on Reader Card

CHAIN SLEEVE CLAMP — The Black Brothers Co., Inc. has published a circular on its No. 2 Chain Sleeve Clamp. Specifically treated is the use of the tool in clamping rubber sleeves to hydraulic pipe lines.

Enter 708 on Reader Card

CONCRETE ADDITIVE — Lambert Corp. has published a brochure on Rapid-Flo, a concrete additive said to strengthen and waterproof concrete. Advantages of the additive and the method of specifying are included in the circular.

Enter 709 on Reader Card

CONCRETE FORMING EQUIPMENT — Symons Clamp and Manufacturing Co. has released catalog F-11 describing its concrete forming equipment, including the all-wood panel, steel ply, high strength panels with steel cross members, H form, champ form, mag-ply and steel strut wide panels. A special section is devoted to safety shores and ever-square column clamps.

Enter 710 on Reader Card

CONTROL PANEL—General Electric Co. has issued bulletin GEA-6334, "Pan-A-Trol, Packaged Control For Industry", containing application information and listing engineering assistance, design, installation, maintenance and field service offered by the company. Descriptive data cover types of devices used for a typical Pan-A-Trol packaged control.

Enter 711 on Reader Card

DEAERATOR — Cochrane Corp. has announced Publication 4652 which describes its tray-type deaerator which is said to provide complete deaeration, plus continuous maintenance of heat balance.

Enter 712 on Reader Card

DEEP TROUGH IDLERS—Barber-Greene Co. has announced Bulletin NT42-A, describing deep trough belt conveyor idlers designed for handling all sorts of lightweight bulk materials.

Enter 713 on Reader Card

DIAMOND TOOLS — Industrial Diamond Information Bureau has prepared a bulletin "The Diamond Tool Industry in 1955." Included is a survey of the diamond tool industry, dealing with various scientific and technical aspects, among which is a discussion of advances in stone sawing with diamond blades.

Enter 714 on Reader Card

DIESEL ENGINES — Cummins Engine Co., Inc. has released a 24-page booklet, "Answers to Questions About Diesels." The booklet discusses the basic features of diesel operation.

Enter 715 on Reader Card

DIESEL-POWERED TOWBOAT — Dravo Corp. has published "The Dravo RAM Towboat", (Bulletin 250-128) describing the features and uses in a variety of inland waterways operations of its RAM-class 70-ft. diesel-powered towboat.

Enter 716 on Reader Card

DIRECTIONAL CONTROL VALVES — The Oilgear Co. has issued Bulletin 80200 on its two-way directional control valves for fluid power systems up to 3000 p.s.i. The bulletin includes details of valve body construction and the functions of standard and special plungers.

Enter 717 on Reader Card

FASTENERS — Star Expansion, Inc., has issued Catalog 5603 on Star fasteners for home and industry. The catalog contains detailed information on the company's line of fasteners and drills.

Enter 718 on Reader Card

FILTER RESPIRATOR — Mine Safety Appliances Co. has published Bulletin 1004-2 on Dustfoe Ultra-Filter Respirator, a unit for protection against minute particles including radioactive dust and air-borne organisms. The bulletin describes the respirator that weighs only 6 oz.

Enter 719 on Reader Card

FORK LIFT DATA—Memphis Equipment Co. has released a brochure containing a cross-section of information on fork lifts. Included are facts on performance, uses, and other data on some of the leading makes of fork lifts.

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FREE INFORMATION

You can obtain catalogs and literature listed on these and other pages of the magazine by entering the number appearing either below or beside the item of interest on the READER-SERVICE CARD in this page.

GRINDING MILL—The Patterson Foundry and Machine Co. has published Bulletin B-562 on the Futura Grinding Mill, a ball and pebble mill for fine grinding (wet or dry) of asbestos, fluorspar, limestone, gypsum, silica, etc. Features outlined are water temperature control, inbuilt motor drive, counterbalanced safety guard, and corrosion control.

Enter 721 on Reader Card

HIGH SPEED VIBRATOR — Martin Engineering Co. has published a booklet on Vibrolator high speed vibrators, corebox protective devices, and foundry equipment. Descriptions of all models are given, along with suggested mountings.

Enter 722 on Reader Card

HIGH TORQUE MOTORS — Robbins and Myers, Inc., Motor Division, has released a bulletin on its new 10 and 15 h.p. All-Weather high torque, capacitor-start, capacitor-run single phase motors. The four-page bulletin describes features of the motors, including protection against weather, debris, and small field animals.

Enter 723 on Reader Card

HOSE — Hose Accessories Co. has released a Le-Hi Condensed Catalog No. 18. This illustrated booklet covers hose couplings, clamps, nipples, valves and manifolds for tunneling, mining, quarrying, contracting, construction, and general industry applications.

Enter 724 on Reader Card

HOSE AND FITTINGS — Aeroquip Corp. has issued a condensed catalog, listing hose, fittings, "Socketless" kits, and self-sealing couplings. Catalog Bulletin 174 contains information on the company's standard industrial products and is designed primarily for use in the replacement field.

Enter 725 on Reader Card

HYDRAULIC TORQUE CONVERTERS—National Supply Co. has issued Bulletin 468 on heavy-duty, single-stage hydraulic torque converters for transmission of 100 to 1000-hp. to excavating, earth-handling, and construction machinery. The bulletin gives specifications of 17 sizes and capacities of torque converters for exact matching with engines.

Enter 726 on Reader Card

IMPACT BREAKER—Kennedy-Van Saun Manufacturing and Engineering Corp. announces Bulletin D-1003 pertaining to the Kennedy Cuber Senior Impact Breaker, Model 3648. The multi-stage, triple action, dual rotor crusher is designed for stationary or portable use. Construction and performance data are supplemented by jobsite photos of the crushers in action.

Enter 727 on Reader Card

METERING SYSTEM—Sparton Control Systems Division has issued a bulletin on Sparton Building Block Remote Metering System. Features, applications, and future expansion provisions are described. The system, with "plug in" construction, employs transducers and electronic bridge circuit.

Enter 728 on Reader Card

PERFORATED STEEL SEGMENTS — Cross Engineering Co. has brought out Form 12155 on its perforated steel segments, sections, decks and parts for vibrating, revolving and shaking, and other types of machinery equipment and facilities. Specifications are given.

Enter 729 on Reader Card

SCRAPER — Euclid Division of General Motors Corp. announces Catalog 552, describing the Model TS-18 Twin-Power Scraper. Condensed specifications and a performance graph provide data on engines, transmissions, tires, scraper controls, weights and dimensions, speeds and grade ability.

Enter 730 on Reader Card

SCREEN — Gilson Screen Co. has announced a service manual and parts list with instructions for installation, operation, and maintenance of Gilson Mechanical Testing screen. The manual has a complete discussion of operating conditions.

Enter 731 on Reader Card

TANDEM AXLE UNITS — Hendrickson Manufacturing Co. has released Bulletin 502 on RT-Series Tandem Axle Units, standard for 6-wheel trucks. Features described include the compression-centering alignment and below-axle road suspension.

Enter 732 on Reader Card

TESTING VIBRATOR—Wheeler Co., Inc. has issued a circular on the Wheeler Testing Vibrator. The leaflet contains general description, parts lists, and instructions for the operation and maintenance of the machines which analyze granular materials.

Enter 733 on Reader Card

TRAMRAIL — The Cleveland Crane and Engineering Co., Cleveland Tramrail Division, has announced a revised edition of Cleveland Tramrail Engineering and Application Booklet No. 2008-M. The booklet discusses the principal components of overhead materials handling systems, track design and advantages of supporting it flexibly; carriers for hand, electric and automatic operation; tractors, track switches, cranes, safety electrification, buckets and grabs.

Enter 734 on Reader Card

VACUUM DRILL — Uranium Enterprises has released a circular on Porto Vacuum Drill, a rotary portable exploration drill adaptable to all types of drilling. Illustrations and descriptions of this portable drill are included.

Enter 735 on Reader Card

WEIGHT CONTROL—The Howe Scale Co. has issued Form 707, describing the Howe Batchmaster for automatic control of materials by weight. Available controls are itemized and illustrated, and operating principles are explained.

Enter 736 on Reader Card

WELDING MATERIALS—Rankin Manufacturing Co. has published a chart of hard-surfacing materials to simplify the selection of the proper Ranite rod for a specific application in comparison with other rods available. Detailed information on the Ranite rods mentioned is printed on the reverse side of the chart.

Enter 737 on Reader Card

WIRE ROPE — Jones and Laughlin Steel Corp. has released a manual, "Wire Rope Is A Machine," which contains information on the selection, installation, and best operating practices for wire rope.

Enter 738 on Reader Card

WIRE ROPE SHEAVES—Sauerman Bros., Inc. has released a bulletin on Durolite wire rope sheaves. Bulletin 165 gives specifications for the sheaves that are now available as replacement in wire rope blocks.

Enter 739 on Reader Card

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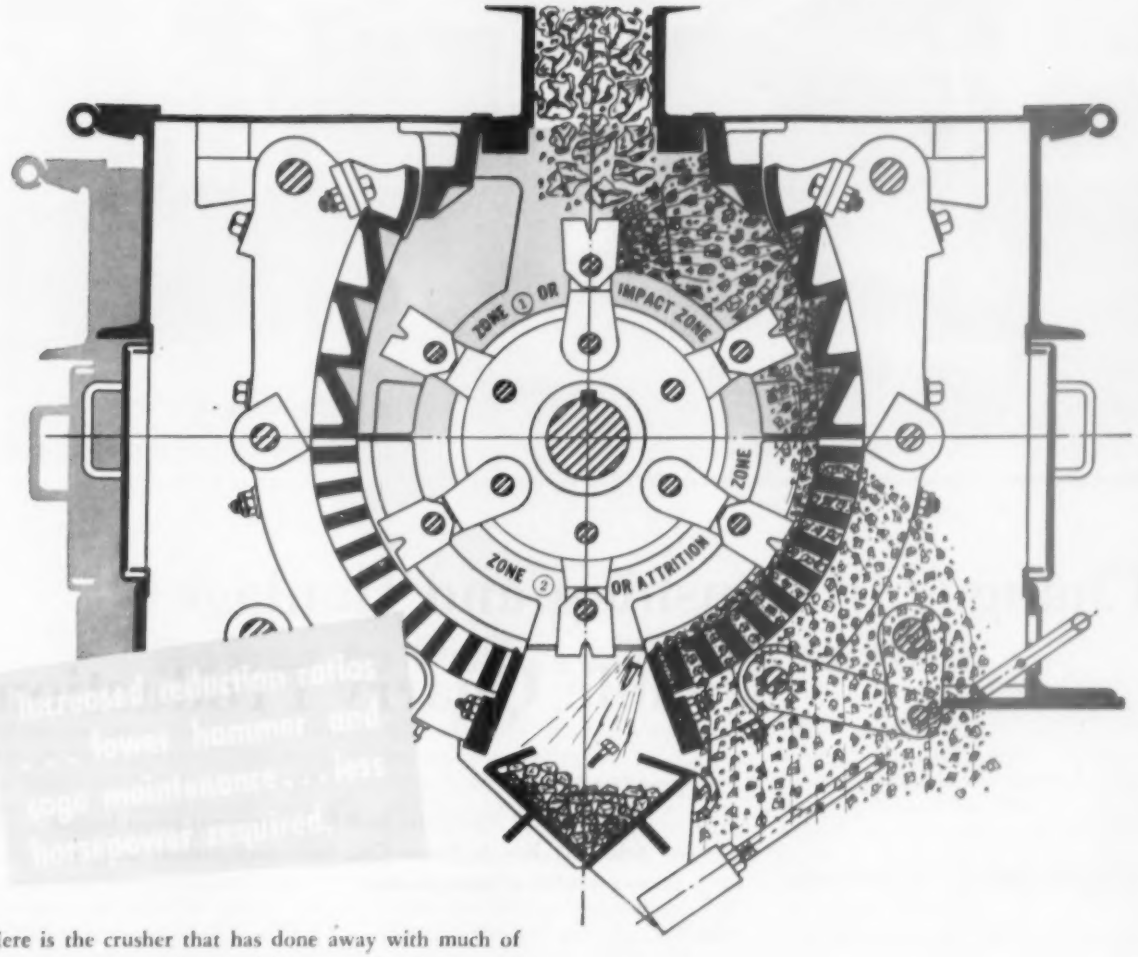
THE HAMMERMILL THAT CUTS PARTS WEAR WAY DOWN

The PENNSYLVANIA REVERSIBLE HAMMERMILL



Here is the crusher that has done away with much of the wear on screen bars and hammers that is expected in hammermills of conventional design. Examine the illustration above. Note that most of the size reduction takes place in the upper or impact zone by free air impact, without any attrition action. Only when particle size is greatly reduced does material being crushed reach the attrition zone where hammers force feed through the cage bars to give a uniform sized product. Thus attrition and wear is held to a minimum. Then too, the reversible feature doubles hammer life and eliminates down time and labor cost of turning hammers. Ask for Bulletin No. 1034 that gives complete details.

PENNSYLVANIA CRUSHER DIVISION
Bath Iron Works Corporation • West Chester, Pa.

PENNSYLVANIA

Thousands of crusher installations plus 50 years experience designing and developing size reduction machinery makes our engineering staff an outstanding group to consult with on crushing problems.

PE-208
Enter 1616 on Reader Card

Side-dump trailer unloading to primary crusher feeder hopper. Portable agstone plant (arrow) can be seen to the right

Changes In Crushing and Haulage Double Quarry Production

PORTABLE

. . . agricultural limestone unit in permanent plant layout of John W. Karch Stone Co., increases output and improves quality of this product

By KENNETH A. GUTSCHICK

IN LINE WITH RECENT TRENDS, John W. Karch Stone Co. has streamlined its quarrying operation near Bryant, Ind., by installing a new (and larger) primary crusher on the quarry floor and simultaneously replacing its quarry rail haulage system with side-dump tractor trailers. The net result has been the doubling of production, with present capacity at 150 t.p.h.

In addition, agricultural limestone output has been stepped up and product quality improved through purchase of a new 20 t.p.h. portable aglime plant, which the company is shuttling between the Bryant quarry and its larger (parent) operation located near Celina, Ohio, about 20 miles distant. The portable plant features the use of a heated screen and a cage mill to produce minus 10 mesh material. It is stationed adjacent to the plant and generally recrushes minus 1-in. stone.

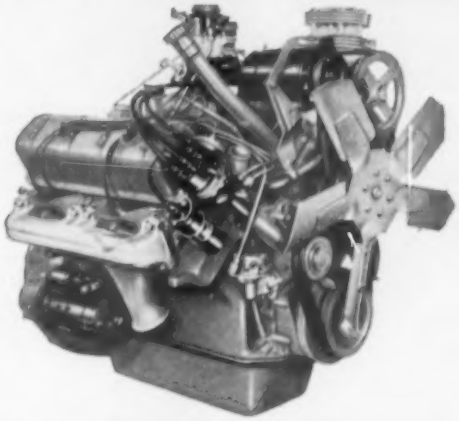
The original operation at Bryant, which was started up by the company in 1922, utilized 2-cu. yd. rail cars in hauling to a 16-in. primary gyratory crusher. Six-car trains were moved by locomotive to a ramp, and the cars hoisted up the incline with winch and cable. This system became outmoded with the deepening of the quarry to a second 25-ft. level in the early 1950's. The new, larger crusher became necessary since a more massive, blocky limestone was encountered in the lower bench. Earlier, the 16-in. crusher had been adequate, since the upper strata are thin bedded (layers averaging 6 in. thick).

In the new set-up, the primary crushing station is located at the base of the ramp, and a 24-in. belt conveyor, 300-ft. centers, mounted on the ramp carries the stone to a surge silo in the plant. To conserve space, the silo was installed in the same location as the old primary crusher. The remainder of the plant was unchanged. This crusher arrangement was adapted from a similar set-up installed by Karch at the Celina quarry in 1947*. A main difference, however, was the use of a large surge pile on the quarry floor following the 36- x 48-in. Lippmann primary jaw crusher.

The Bryant quarry is developed in the Huntington dolomite (Niagaran age). Primary drilling is handled by a

(Continued on page 136)

New Heavy-Duty V-8's—206, 226 and 257 hp.



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Off the road or out on the highway, new INTERNATIONAL V-Line trucks get loads moving *fast*, keep them moving. They are powered by new heavy-duty V-8's with the most GO under any truck hood. You get economical operation, top performance. You haul big, profitable loads.

Only INTERNATIONAL short stroke, Y-block V-8's have all these long-lasting, cost-cutting features—"wet" replaceable exhaust valve guides, positive type valve rotators, exhaust valve faces and seats of Stellite, neoprene intake valve shields, sodium filled exhaust valves (V-549). Plus many new lightweight features that reduce costs and increase payloads.

With new V-Line design, there's rugged construction that will take all the off-highway punishment you can give these trucks. There's lots of roomy comfort in the sturdy Comfo-Vision cabs, too. Why not drive one today? See your INTERNATIONAL Dealer or Branch.

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Portable agricultural limestone plant mounted adjacent to permanent plant. Conveyor on left moves minus 10-mesh agstone to stockpile on quarry floor

Vibrating pan feeder serving 40- x 40-in. impact-type crusher

Loading side-dump trailer with 1½-cu. yd. shovel at first quarry level

crawler-mounted Loomis No. 44 churn drill, putting down 6¾-in. holes. Modern blasting practices are followed, through use of Hercules explosives, Primacord, and ms. delay caps. A 1½-cu. yd. Lima 604 diesel shovel loads to two 8-cu. yd. Easton TR-8 side-dump trailers pulled by Ford F800 tractors. Overburden, averaging 4-ft. thick, is removed by a 1¼-cu. yd. Lima 101 shovel, which incidentally the company has used in quarry service since 1929.

The stone is dumped with a standard Easton hoist into a steel hopper and fed by a 4- x 10-ft. Jeffrey-Traylor electric vibrating feeder to a Jeffrey 404 Rockbuster. Material enters the 40- x 40-in. opening through a chain curtain and passes over a trapezoidal bar grizzly which removes (minus 1½ in.) "fines"; the grizzly has openings varying from ½-in. (at feed end) to 1½ in. The crusher-rotor, weighing 5 tons and carrying two manganese impact bars, is V-belt driven at 870 r.p.m. by a 150-hp. Westinghouse Type CW wound rotor motor. The minus 3-in. crusher product is discharged to the 300-ft. plant delivery conveyor through a stone box-chute to reduce wear on the chute and belt. This conveyor, inclined at 18 deg., is housed the entire length—the first 100 ft. in a concrete tunnel, the remainder being enclosed by arched corrugated steel sheeting. Surge storage is provided by a 15-ft. dia. x 20-ft. high Neff & Fry concrete-stave silo, with a live capacity of 150 tons.

Stone is reclaimed from the silo by a 30-in. x 5-ft. Jeffrey-Traylor vibrating feeder and carried by a 62-ft. bucket elevator to the top screening floor. The plant incorporates two 4- x 10-ft. Tyler-Niagara double-deck screens (one operated wet), a Tyler-Hum-mer 4- x 5-ft. single-deck screen, and a Symons 3-ft. shorthead cone crusher, the latter being closed-circuited to the top screen by the bucket elevator. Finish products range from 3-in. to agstone; these are stored in three 150-ton bins and two 75-ton bins.

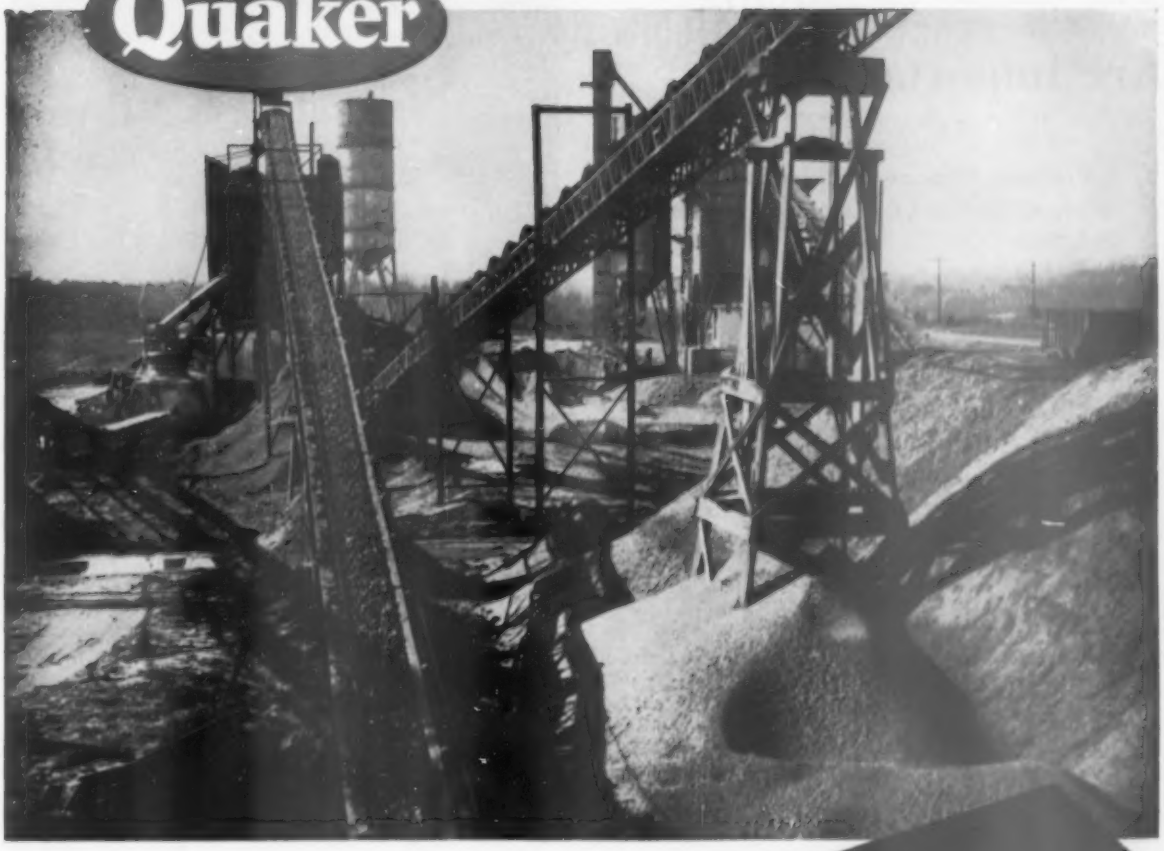
Water for plant use is obtained from the quarry sump hole by 6- and 4-in. Gormann-Rupp pumps, which in turn feed a Weinman high-pressure pump (25 hp. drive) delivering the supply to the top of the plant. The 6-in. pump is a stand-by, and is operated by float-control only when the sump level is high.

The portable aglime plant is an Eagle Crusher Co. Model 5400 unit, incorporating a 5-ton hopper, into which trucks dump directly, a 4- x

*Described in ROCK PRODUCTS, October, 1947, p. 92.

(Continued on page 146)

Quaker



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No matter what you consider most important in a conveyor belt, there is a Quaker-Quaker Pioneer belt constructed to meet your need. This one, for instance, is especially made for tough shock resistance. Highly flexible, it is strong cotton duck, with average cover tensile strength 2500 to 3000 lbs. Skim coat between plies. For jobs requiring even greater troughability, tension resistance and flexing, Quaker can supply belts of new high tensile strength rayon or cotton-nylon fabrics of any desired cover thickness. Complete line offers industrial rubber products including hose, packing and moulded rubber for every use.

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The Little Accidents Are Important

• Portland Cement Association launches safety campaign to prevent non-disabling accidents

By HUBERT C. PERSONS

First-aid facilities are an essential part of every cement company's safety program

PREVENTION OF NON-DISABLING ACCIDENTS is to be accented in the Portland Cement Association's broadened plant safety campaign. Although the Association's accident-prevention work has reduced the frequency of disabling injuries 90 percent in 40 years, there has been relatively little attention given to minor accidents. Effort has been concentrated on major causes of disabling injuries.

Less serious injuries are an index to unsafe plant conditions that, if uncorrected, might cause severe accidents. Attacking the problem of minor injuries is necessary to give a realistic picture of safety accomplishments in cement plants, according to Ivan F. LeGore, association safety director.

Until recently, non-disabling injuries were usually not reported. Consequently plant personnel treated them rather lightly. Cement plants are now asking for the cooperation of employees in reporting **all** accidents. Accurate reporting of minor injuries can be important to studies aimed at preventing serious casualties.

A study of non-disabling injuries, safety-conscious cement plant executives point out, can be of great value in identifying unsafe locations or conditions, dangerous methods and acts. They emphasize that correcting conditions which have been contributing to minor injuries eliminates hazards that could cause severe injuries or fatalities. Actually, they say, records of non-disabling injuries provide a measure of the effectiveness of a plant's safety program. Studies of such records give supervisors and safety men definite information of value in planning future programs.

Another spur to action is the belief of safety-minded cement men that more attention to minor injuries now may stimulate interest of plant personnel in safety work. They believe this because safety work has been so successful. There are now 30 plants that have had no disabling injuries in three years or more.

The success of the safety program in the cement industry is due largely to the effective cooperation of employes in the plants. A plant with years of operation with no disabling accidents, feels it important now to avoid a let-down in effort by enthusiastic personnel who might feel that their job has been done.

It has been recognized for years that there are lessons to be learned from non-disabling injuries. An executive of the National Safety Council, as long ago as February 22, 1937, delivered an address entitled, "The Importance of Unimportant Injuries." In 1944, the Bureau of Labor Statistics of the U. S. Department of Labor published a report on, "The Importance of Minor Injuries in Shipyards." This showed that in 1943, for every disabling injury to shipyard workers there were 29 non-disabling injuries.

A "Hand Protection Program" was begun by one multi-plant cement company after its analysis of so-called minor injuries. This was based on the finding that, in one plant, 57 percent of the non-disabling injuries in 11 months were finger or hand injuries. The company's safety department launched the program in December, 1955, with a letter to all plant employes displaying a photograph of a hand injury. Above the picture is the question, "Is This Your Hand?" A line below the picture asks, "Could This Injury Have Happened to You?"

Text of the letter emphasizes the protective features of leather gloves. Following the letter, large display cards were posted in various parts of the plant. These cards carried a dramatic 8- x 10-in. photograph of an actual hand injury and asked the question: "Are These Your Hands?" Four additional cards were posted in the plant in a series of two each week. They were headlined to further emphasize and dramatize the hand theme.

Company officials say it is still too early to evaluate the effect of the hand campaign. But the activity may be extended to other plants.

A new discussion manual has been prepared by P.C.A., because not all of its member company plants have previously kept adequate records or filed reports on non-disabling injuries. The new approach in safety has been explained in detail at a series of regional safety conferences conducted by the Association's Accident Prevention Bureau. The discussion manual, which was prepared for these meetings, had this to say about the minor injury study:

"Reply to the question: 'What kind of safety work can be done in a plant that has a zero frequency rate?' should take into account the fact that a zero frequency rate of disabling injuries does not mean there are no accidents. Accidents may still occur, some causing injuries that require first aid, some causing injuries that require a doctor's care and some resulting in no injuries at all.

"Minor accidents, like those producing disabling injuries, are symptoms of something wrong and for this reason merit review. Any one minor injury may seem unimportant, but groups of them are significant. Thus, it is beneficial to classify them according to agency, cause and type of accident and location of occurrence, as well as by any other pertinent factors for study.

"To promote better understanding of the minor injury situation in plants, and the benefits obtainable from its consideration, the Accident Preven-

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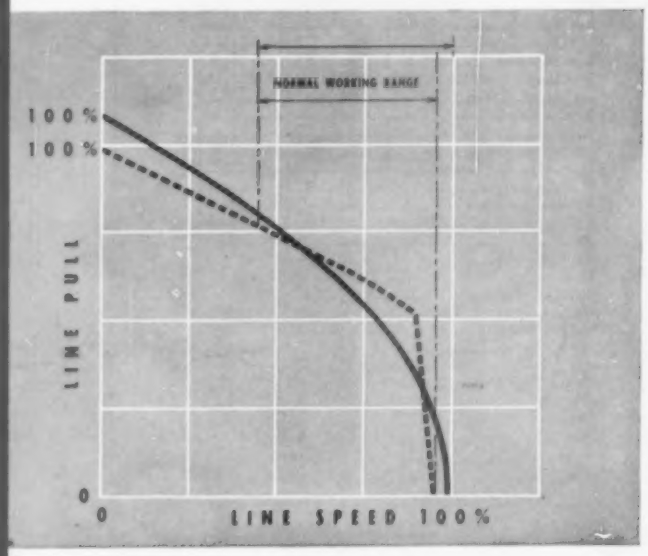
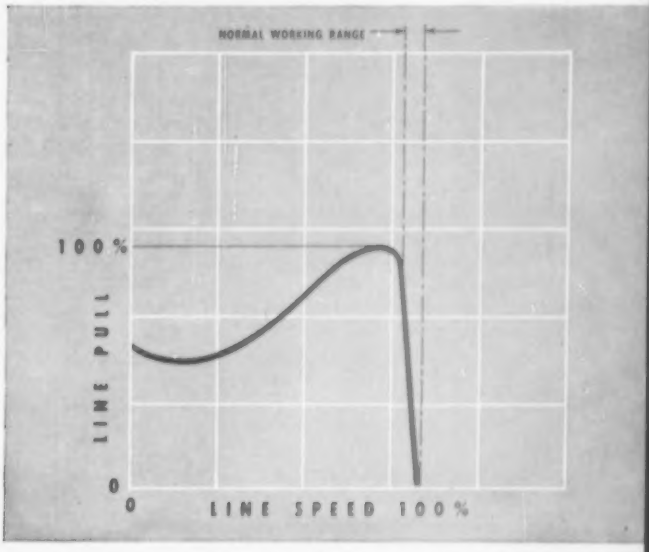
LIMA teams A.C. electric motor with torque converter for power-on-demand through wide operating range



Power Performance of LIMA'S New Optional Unit:

A.C. Electric motor with torque converter drive. (Diesel-torque converter curve (dotted line) shown for comparison.)

With this drive, even under extreme loading, the motor will pull down in speed only a very small amount. It can never be stalled. The line pull will constantly increase through a long pull down speed range, depending upon the load applied.



Power Performance of A.C. Electric Motor with Direct Drive:

The motor speed and torque vary as shown for line speed and pull.

With a pull down in speed of only 3% to 5%, torque rises too fast. The motor will stall quickly after peak torque is reached. Workable speed range is small, stalls are frequent.

Lower First Cost — Reduced Maintenance

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Combining a single A.C. motor with a single stage torque converter, this drive matches, *electrically*, diesel-torque converter performance. It powers all motions and permits application of full power to any one motion as required. Under extreme loading, required power output is supplied at constant motor speed . . . and the motor can't stall or burn out.

The simplified electrical setup—with single A.C. motor and no complicated electrical controls—means lower first cost. Electrical maintenance is reduced to a minimum, and servicing does not require highly trained personnel.

Just check the performance curves above. You'll quickly see that Lima's quality-built electric power unit provides the ideal answer for *your* jobs calling for electrically powered machines. You'll get maximum power performance under all operating conditions. Get full details now from your nearby Lima distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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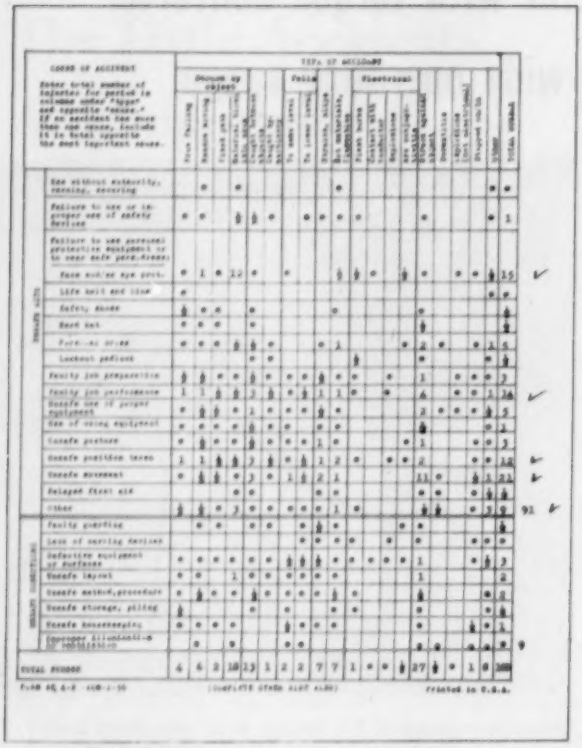

Table 2-A: Break-down by type of accident

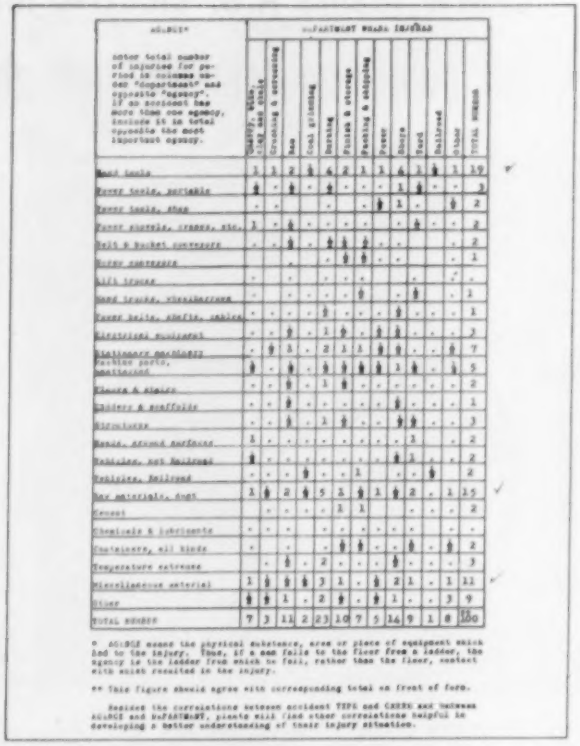

Table 2-B: Break-down by area of plant and quarry

tion Bureau has undertaken to develop information on the problem among member company units. Forms have been sent to all units with an invitation to report, in monthly summary form, their non-disabling injury experience.

"The Bureau studies these returns and publicizes the lessons of the analysis. It is a well-recognized fact that a person may not be injured as a result of each violation of a safe practice or each exposure to a hazardous condition. He may receive from such an exposure no injury at all, or only a minor hurt, or possibly a disabling injury. But sooner or later, if he persists in so exposing himself, he will be seriously, if not fatally, hurt. This fact is borne out by recent studies of cement plant experience showing that as injury frequency increases, injury severity increases. Organizations inclined to disregard the importance of minor injuries or a few disabling injuries each year are probably headed for more trouble.

"If uncorrected conditions and work practices exist, sooner or later they will produce exceptionally severe injuries. It is for this reason that analysis of accidents that result in no loss of time or permanent disability is as important in accident prevention as is study of mishaps causing disabilities. Safeguarding measures and the correction of unsafe methods and practices leading to minor injuries eliminate dangers that could produce more severe injuries and fatalities.

"Any increased attention to minor injuries should not be permitted to influence employes to avoid reporting such cases. In fact, every effort should be made to encourage prompt reporting and prompt treatment for all minor injuries."

Table 1: Summary of non-disabling injuries in the five-month period, August to December, 1955. Average number of injuries per plant per month are 21 in the 111 plants reporting

Delay may be costly. A study of some minor injury cases reported from 1952 to 1955 shows how serious the results of delayed first-aid may be. A total of 78 cases of delayed first-aid

(Continued on page 142)

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For example, there's the extra strong yet light front end for steady, high output on the toughest job. There's responsive Ward Leonard electric control for fast acceleration and deceleration, speeded-up work cycles. Laboratory controlled, heavy-duty construction keeps maintenance costs low, adds greatly to machine life.

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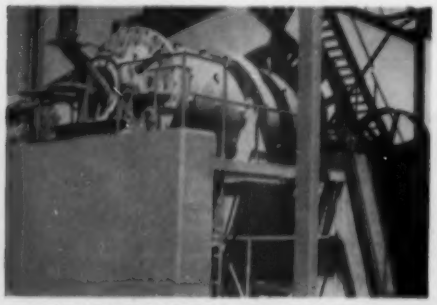

Typical installation of Marcy Center Peripheral Discharge Mill.

- **stronger concrete**
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OPERATING ADVANTAGES—Compared with crushing, experience has proved these additional advantages of grinding by Marcy CPD Mills:

LOW COST...low maintenance, less steel consumption and less power per ton result in an overall cost generally less than 25c per ton, exclusive of ammortization.

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WET OR DRY GRINDING
Capacities from 2 to 200 dry tons per hour.

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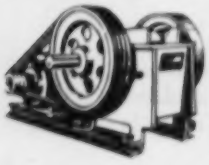

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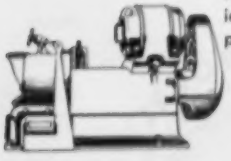

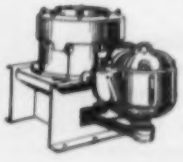

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LITTLE ACCIDENTS

(Continued from page 140)

eventually resulted in the loss of 1952 days work, chiefly due to infection. These cases are tabulated:

Year	Number of cases	Days lost
1952	24	506
1953	25	716
1954	17	482
1955	12	248

Plants began reporting minor injuries to the Association's Accident Prevention Bureau on a planned basis in August, 1955. Summary of the accident experience reported by 111 plants for the five-month period ending December 31, 1955 shows that each plant had an average of 21 injuries per month, or a total of 11,050. The summary is shown in Table 1.

New report forms were provided by the Accident Prevention Bureau on January 1 this year. Companies now report both disabling and non-disabling injuries. New data requested include the location or department in which the accident occurred.

In summarizing the reports for the first three months of 1956, the Bureau pointed out that the departments with the highest frequency of minor injuries were burning, shops, raw and finish storage, in that order. For the same period, the Bureau reported that the most disabling injuries occurred in quarry, burning, raw and finish storage departments, in that order.

The agencies causing the greatest number of non-disabling injuries were listed as hand tools, raw materials, miscellaneous material, stationary machinery and machine parts. The disabling injuries were involved with miscellaneous material, machine parts, railroad vehicles, raw material, power shovels and cranes. The three-month summary ending March 31, 1956 for non-disabling injuries is shown in Tables 2A and 2B. It should be noted that there are two different forms, one showing the nature of the accident causing the minor injury, and the other tabulating the plant department and the tool, equipment or vehicle involved.

In reporting the three-month 1956 summaries to companies, the Accident Prevention Bureau said:

"There is no element of chance involved in the frequency of accidents. All accidents are caused. But chance does affect the severity of an accidental injury. It may be non-disabling, such as a majority in shops or those caused by hand tools; it may be disabling, as more probable in hazardous quarry operations; or it may be fatal. More thorough study by each plant of

(Continued on page 145)

BUILT FOR ROCK-HARD ROAD WORK

The Allis-Chalmers HD-21 is a Real Quarry Tractor

Chiseling an access road through rock demands "something extra" in crawler tractor performance and durability, yet it's the kind of job any quarry tractor may be required to do.

Conditions like this call for an Allis-Chalmers HD-21. Its 204-hp Allis-Chalmers engine is noted for its ability to perform with a minimum loss of efficiency even after thousands of hours of operation. Torque converter drive multiplies torque up to 4½ times . . . . . cushions the entire power train against load shocks.

New Tru-Dimension tracks bring a new high in track durability. Thousand-hour lubrication intervals save maintenance time. Positive seals protect idler, support roller and truck wheel bearings from abrasive wear as no other seals can.

Ask your Allis-Chalmers dealer to show you the many other features that make the HD-21 a natural for rock-hard assignments.

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FARMER: *"Quick trips with full loads often make the difference between profit and loss on a whole crop."*

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its non-disabling injuries should control and reduce them, thus automatically curbing and eliminating disabling injuries and fatalities." In this way the portland cement industry, consistently among the safest of all heavy industries, may well improve upon its own fine record.

Material Requirements For Highway Program

NATIONAL SAND AND GRAVEL ASSOCIATION, Washington, D. C., has distributed figures released by the U. S. Bureau of Public Roads estimating material requirements for highway construction of all kinds in the 13 fiscal years which began July 1, 1956.

Average annual demand for sand and gravel, crushed stone and slag in those 13 years will be slightly more than 700,000,000 tons, it is predicted. This compares with 375,396,748 tons used in 1953, an increase of 87 percent.

Demand (in million bbl.) for cement in the 1957-1969 period is as follows: 1957, 94.5; 1958, 102.9; 1959, 107.4; 1960, 110.5; 1961, 110.8; 1962, 111.2; 1963, 111.5; 1964, 113.3; 1965, 113.6; 1966, 112.6; 1967, 110.1; 1968, 103.6; 1969, 97.0. Total: 1,399,000,000 bbl.

Aggregates (in million tons) have been estimated as follows: 1957, 664; 1958, 722; 1959, 753; 1960, 774; 1961, 774; 1962, 774, 1963, 775; 1964, 774; 1965, 774; 1966, 774; 1967, 774; 1968, 710; 1969, 668. Total: 9,710,000,000 tons.

Demand for concrete culvert pipe has been estimated in million tons, as follows: 1957, 3.29; 1958, 3.57; 1959, 3.72; 1960, 3.83; 1961, 3.83; 1962, 3.83; 1963, 3.83; 1964, 3.83; 1965, 3.83; 1966, 3.83; 1967, 3.83; 1968, 3.51; 1969, 3.30. Total: 48,030,000 tons.

Estimated demand for bituminous material (in million tons) is as follows: 1957, 8.73; 1958, 9.49; 1959, 9.90; 1960, 10.18; 1961, 10.18; 1962, 10.18; 1963, 10.18; 1964, 10.18; 1965, 10.18; 1966, 10.18; 1967, 10.18; 1968, 9.34; 1969, 8.77. Total: 127,670,000,000 tons.

Adds Storage Bins

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., is adding new cement storage bins and enlarging the packing and loading facilities at its Metaline Falls, Wash., plant. Total cost of the project is $2 million.

Sixteen new bins will have a capacity of 240,000 bbl. Construction is expected to be completed by the end of this year.

Specially Engineered Equipment

This Yuba dredge, built for Charles T. Hover, general engineering contractor, Burlingame, Calif., has hull 7' x 40' x 140', is designed so its 6-yd. clamshell rig can easily be removed for land use. Like Yuba bucket ladder and hydraulic dredges, it's built to fit the job.

For moving Sand, Gravel, Rock, Earth
Built by YUBA

Yuba brings to your materials handling problems a half century of experience designing and building special machinery — hoists, conveyors, drives, digging, screening and sizing equipment, winches, pumps, hauling units, barges, etc.

We're equipped to design and build complete systems to fit your needs. For example, Yuba-built dredges for mining and aggregate handling usually include digging, processing, and conveying equipment — all in one plant.

We can build in our own plant machinery of almost any size. Facilities include: Engineering and designing, structural steel fabricating, heavy and light machining, welding, forging, heat treating, pattern making, export packing and shipping. Thus you have one source, one responsibility for your entire job from designing through supervision of field assembly, where required. You save the headaches of dealing with multiple suppliers.

Our plant is located on San Francisco Bay at Benicia, giving you a choice of shipping by water, rail or truck.

YUBA DREDGES — PROVED DEPENDABILITY AROUND THE WORLD

Price-wise we're competitive. Consult us NOW for help on specially-engineered equipment. Wire, write or telephone Exbrook 2-0274.

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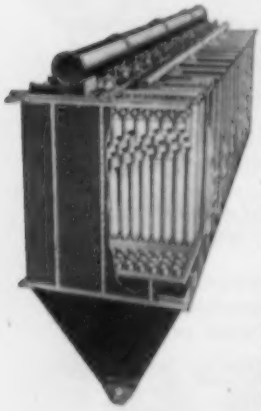
That's the guarantee you get with **Norblo** Automatic Bag Type Arresters

By "constant" we mean what operating men *expect* it to mean when applied to dust collection — *no* loss of suction drop, *no* down time, *no* variation in capacity.



Norblo's unit compartment system, with automatically controlled progressive and cyclic bag cleaning maintains the full capacity for which the particular installation is engineered. Bag cleaning is easily regulated if dust loading rate should change. Only one compartment is cut out at a time for cleaning (and that for only a few seconds) by means of moderate shaking which insures long bag life. A small quantity of reverse air is used to prevent unwanted dust flow during shaking operation. Excess dust is dropped without destroying the desirable basic filter cake.

Profitable, consistent performance of Norblo automatic dust and fume collection equipment is demonstrated in hundreds of important installations. If you need this facility for production, for salvage, or for good housekeeping, ask Norblo engineers what they can do for you. Write for Bulletin 164-4.

The Northern Blower Company
Engineered Dust Collection Systems for All Industries
6408 Barberton Ave. OLympic 1-1300 Cleveland 2, Ohio

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DOUBLES QUARRY OUTPUT

(Continued from page 136)

8-ft. Deister single-deck screen fitted with a Hannon electric screen heater, and a 38-in. 4-row Stedman-type cage mill. At Bryant it is mounted adjacent to the stone plant and at quarry edge, permitting agstone to be stockpiled on the quarry floor (first level) between the primary conveyor and the quarry truck ramp.

The feed consists of either minus 1-in. stone or waste screenings formed during the washing operation. This latter material is reclaimed by clamshell from a tailings pond located on the quarry floor; generally, only the drier waste material is used. Material is transferred from the hopper by a Jeffrey-Traylor M3 vibrating feeder to an 18-in. belt conveyor serving the screen. Separation is at 10-mesh (stainless steel cloth), with the fines dropping to an 18-in. stockpiling conveyor, the oversize going to the crusher. Use of the screen heater tends to eliminate blinding, thereby increasing production and improving product quality. The cage mill, which is V-belt driven by 60- and 75-hp. Howell electric motors, is closed-circuited to the screen by an 18-in. conveyor discharging to the vibrating feeder. The entire plant is electrically driven (440 v. current).

The Bryant plant is owned by George E. Karch and Pat A. Karch, partners. The former is also president of the Celina, Ohio, company, which is incorporated, and general manager of both operations. John C. Sink is manager of the Bryant plant.

The Bryant plant is owned by the

Pat A. Karch and George E. Karch

"Started with one AMSCO® pump in 1926 ... now we have 17 in operation"

Twenty-nine years ago, the Brighton operation of American Aggregates Corporation began hydraulic dredging operations with one 15″ Amsco pump. Today, they have 17 pumps in operation, including 6, 10, 12, 16 and 20″ units.

Because the Brighton operation pumps a 60% sand, 40% gravel mixture —just the reverse of American Aggregates market demand—there is substantial pump-back of sand into the excavations. This heavy demand on the pumping equipment is partially responsible for American Aggregates' trend to larger pumping units. According to Mel Kerr, American Aggregates Vice President, "That new Amsco 20″ pump certainly does a job. We produce more on two shifts with this unit than we did with five shifts using a 16″ pump."

Last year, American Aggregates relied on Amsco pumping equipment to make them the world's largest producer of commercial processed sand and gravel.

QUICK FACTS ABOUT AMSCO PUMPS. Whether your dredging operation is large or small, you can get an Amsco Dredge Pump to handle the job. Standard sizes range from 6″ to 20″ discharge openings. Larger sizes are also available. An Amsco pump engineer will be glad to discuss your requirements, or write for Bulletin 1052P, giving full information and specifications on the Amsco line.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DELAWARE, OAKLAND, ST. LOUIS, JOLIETTE, QUEBEC

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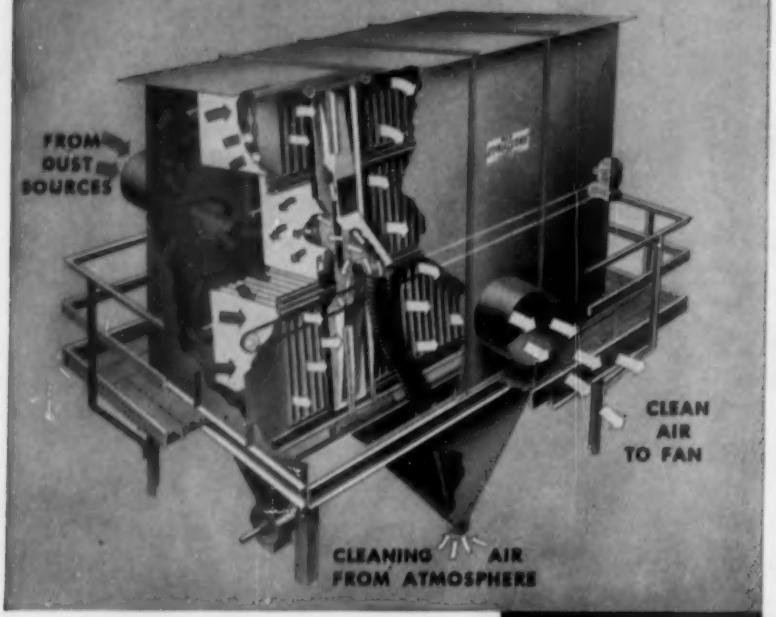
SLY DYNACLONE®

(PATENTED)

FOR CONTINUOUS DUST COLLECTION



PROVEN IN USE IN HUNDREDS OF PLANTS

The first reverse air cleaning unit produced in the United States, the Sly Dynaclone has proven during the past six years that it is the most efficient dust filter ever made. It operates continuously — reclaims *all* the dust to keep plants clean. Thus, valuable material is saved, worker comfort and efficiency improved, cleaning and maintenance costs reduced. The *original* self-cleaning dust filter, the Dynaclone is manufactured by Sly, pioneer and leader in dust collection equipment and original patentee of the cloth-type filter.

HOW IT WORKS

Dust-laden air is drawn in from dust sources . . . diffused into dust chamber by baffle plate . . . drawn through fabric of filter bags and cleaned. Clean air passes out the case and into suction fan. Concurrently, traveler moves back and forth across dust wall, registering successively with one bag at a time. Suction existing in the dust chamber draws atmospheric air through the bag in reverse direction, cleaning the bag.

MANY IMPORTANT ADVANTAGES

- Constant suction at dust sources
- Self-cleaning for continuous operation—no mechanical shaking
- No auxiliary motors or blowers—the main operating fan does the cleaning
- No abrasion of bags by the cleaner—minimum maintenance
- Compactness for space-saving installation
- Advanced design for ease of installation

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THE W. W. SLY MANUFACTURING CO.

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OFFICES IN PRINCIPAL CITIES

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Karch family (a partnership). John C. Sink was manager of the Bryant plant for approximately 30 years. Jos. T. Suhr is the present plant manager.

Fly Ash in Cement

CARROLLVILLE DEVELOPMENT LABORATORY of Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has run pilot scale tests with fly ash substituting for shale or clay in the raw material from which portland cement is made.

The ACL pilot cement plant determined the fly ash to be a suitable pelletized feed. The raw materials were blended to proper proportions and maintained in pellet form to assure uniformity throughout the process and uniformity of cement clinker.

Association Insignias

SOUTHERN CALIFORNIA ROCK PRODUCTS ASSOCIATION and Southern California Ready Mixed Concrete Association, Los Angeles, Calif., have adopted the insignias shown in the illustrations. Member companies are furnished transferable decals, small ones for automobiles and larger ones for trucks. Lettering on the upper portion of the octagon-shaped insignias is in yellow and black on green, and, at the base, in yellow on black.

Decals for placing on motor vehicles of member companies

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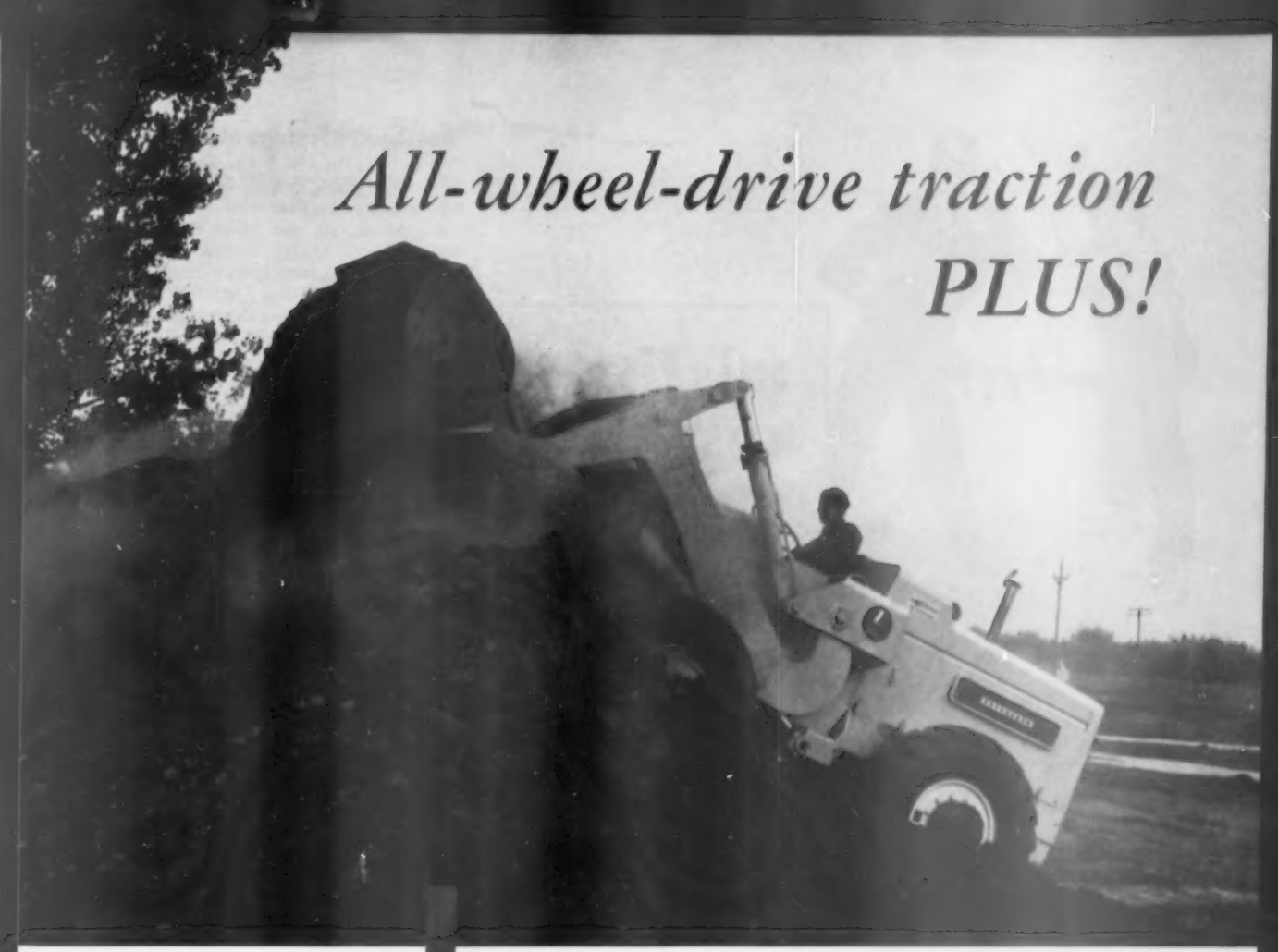

All-wheel-drive traction PLUS!

Digs More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back *at ground level* gets BIGGER LOADS with less spillage.

Carries More

Heaped loads are cradled closer and lower for greater stability while carrying. Exclusive load shock-absorber also cushions the load, smooths the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result — you *deliver* more yards per load and more loads per hour.

One of the big reasons why the new all-wheel-drive "PAYLOADER" tractor-shovels can accomplish more *work* and can do more *jobs* is the BONUS tractive effort provided by their power-transfer differentials. This important feature — exclusive with "PAYLOADER" in the tractor-shovel industry — automatically transfers more power to the wheels on the firmest footing. You get traction and action instead of wheel-spinning inaction on sand, mud and snow.

These outstanding machines also have "no-stop" power-shift transmissions, torque-converters, planetary final drives, power-steering, 4-wheel power brakes. Your "PAYLOADER" Distributor is ready to show you *all* the superior features of these three new models. A demonstration will convince you that they are the finest, most productive units, size for size, in tractor-shovel history.

THE FRANK G. HOUGH CO.
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Send data on "PAYLOADER" Tractor-shovels

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City _____ State _____

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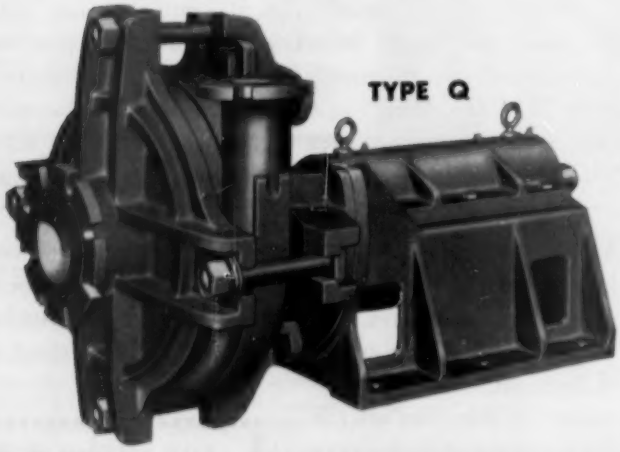
Coddling old pumps, "bargain" pumps or pumps that weren't engineered for the job can be an expensive proposition.

When misfits like this are put to work, they generally can handle only half the job they should. Often their "downtime" is greater than their operating time. And when pumps fail the greatest cost is not for repairs—but for lost production.

Start today by replacing "misfits" with new Morris pumps. For nearly a century Morris has been manufacturing a complete line of top quality pumps to meet the diversified requirements of industry. Every Morris pump has been specially designed and engineered to handle a specific job and to give you years of trouble-free service under the most rugged conditions.

Specify Morris when you want lasting pump value . . . it will save you money in the long run.



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CENTRIFUGAL
PUMPS

● **Free Service.** Morris Engineers will be glad to recommend the pump best suited to your needs for size, capacity, etc. Send necessary data today to Morris Machine Works, Baldwinsville, N. Y.

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Montana Phosphate Mine

J. R. SIMPLOT CO., Pocatello, Idaho, began operations in mid-August at its Centennial phosphate mine near Monida, Mont., on the Idaho-Montana border. Acid grade ore reserves of 30,000,000 tons have been established by exploratory drilling, 5,000,000 tons of which will be mined in open pit operation, and 25,000,000 tons, by underground mining.

Presently, ore is being hauled to Monida for shipment, but a railroad is being planned to Lakeview, Mont., where the ore will be crushed and loaded in rail cars for shipment.

Rail Shipments Studied

NATIONAL INDUSTRIAL SAND ASSOCIATION, Washington, D. C., has released its study of railroad car shipments for member companies for the second quarter of 1956 compared with shipments in the second quarter of 1955. Railroad car shipments for industrial sand during the quarter totaled 54,280 cars, an increase of 4092 cars over total car shipments in the second quarter of 1955. This was approximately 8.2 percent higher.

Shipments by truck for the same periods showed an increase for 1956 of 123,070 tons over the earlier period, with 372,634 tons being trucked the second quarter of 1956.

To Double Output

CONSOLIDATED CEMENT CORP., Chicago, Ill., has authorized additional facilities for its new plant at Paulding, Ohio, which will double that plant's original capacity. Smith W. Storey, president of Consolidated, said that the Paulding plant, scheduled to begin operating early this month at the rate of 1,250,000 bbl. a year, will be equipped by late 1957 to double that output.

Riverton Lime Sold

RIVERTON LIME AND STONE CO., Riverton, Va., was acquired by Chadbourn Gotham, Inc. Stockholders of both companies recently approved the transaction. Riverton produces hydraulic lime, crushed stone, mineral wool, and related products. It has plants at Riverton and Piney River, Va.

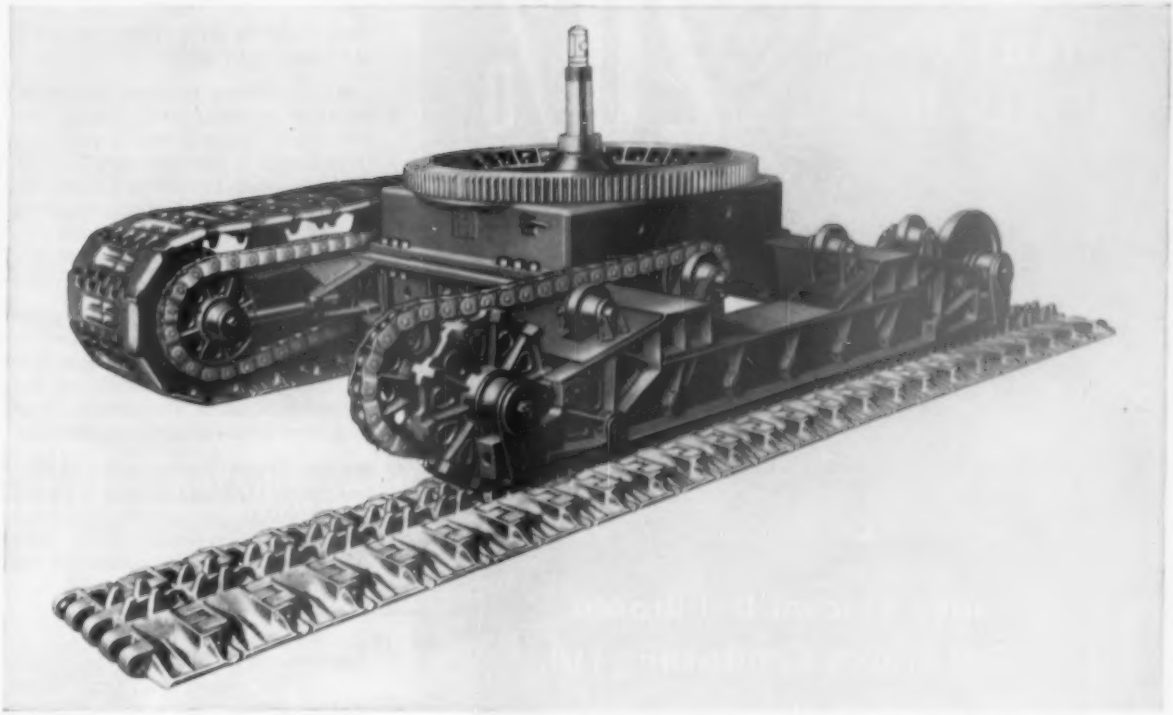
Missouri Plant Expands

MISSOURI PORTLAND CEMENT CO., St. Louis, Mo., has scheduled an expansion program which will double the capacity at its Sugar Creek, Mo., plant. This will bring production to 2,400,000 bbl. annually.

Thew Shovel says:

"JEFFREY CHAIN suits our rigid requirements to a T*"

*T for Thew, of course.



Preparing a shovel crawler for final assembly, showing Jeffrey STR drive chain.

THE BEST evidence of the quality of a product is the company it keeps. Jeffrey is proud that its chain is selected for powering drives on many power shovels. The quality of the product makes the difference.

Whether your requirements are for power transmission or conveyor service, there's a Jeffrey chain best suited for your purpose. Our engineers will help you select the chain you need.

THE JEFFREY MANUFACTURING CO., COLUMBUS 16, OHIO

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CONVEYING • PROCESSING • MINING EQUIPMENT
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Below: Model 85 Lorain Shovel by Thew.

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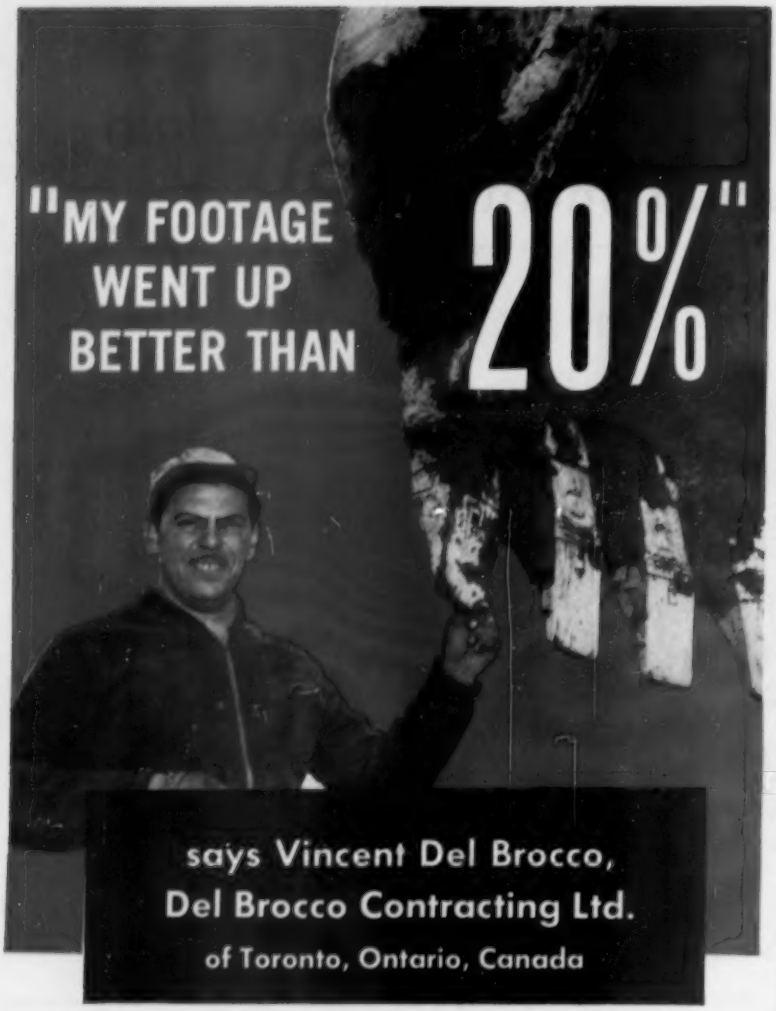

"I converted my Northwest 41 over to use an *ESCO* 1-yard Fastback® Hoe, cutting a 36-inch trench. My footage went up better than 20% and thanks to *ESCO* sharp points, I can dig shale and hardpan without shooting. For more feet of trench a day I prefer the *ESCO* hoe with adapters and sharp points."

ESCO has a Hoe Bucket of the right shape and size for your machine and for your kind of digging. Call your *ESCO* dealer today. He will show you how you can increase your footage . . . cut your production costs.

Ask for FREE copy of "ESCO Fastback HOE DIPPERS"

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In Canada, ESCO Limited Manufacturing Plants
Vancouver, B.C., and Toronto, Ontario.

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Highway Highlights

● A $25 MILLION STATE BOND ISSUE was approved by the Michigan State Municipal Finance Commission to finance construction of 218 miles of 4-lane divided superhighways, costing an estimated $125,000,000. Remainder of the money will come from the federal government. Construction contracts for some projects may be let by late fall or early winter.

● A TURNPIKE TRAVERSING NORTHWESTERN PENNSYLVANIA, linking the New York Thruway with a proposed Ohio Turnpike extension may be built as a free road. The 46-mile extension of the Pennsylvania Turnpike has been taken over by the State Highways Department for planning. Federal aid will be sought.

● OCTOBER 15 HAS BEEN SET by South Louisiana Turnpike Commission as the deadline for receipt of sealed bids on completion of all work on the projected Acadian Throughway, running from Donaldsonville to Lafayette.

● THE TEXAS STATE HIGHWAY DEPARTMENT announced it will spend $229,800,000 on construction and $35,600,000 on maintenance next year. $117,400,000 in federal aid will be added to the state funds.

Expansion at Maritime

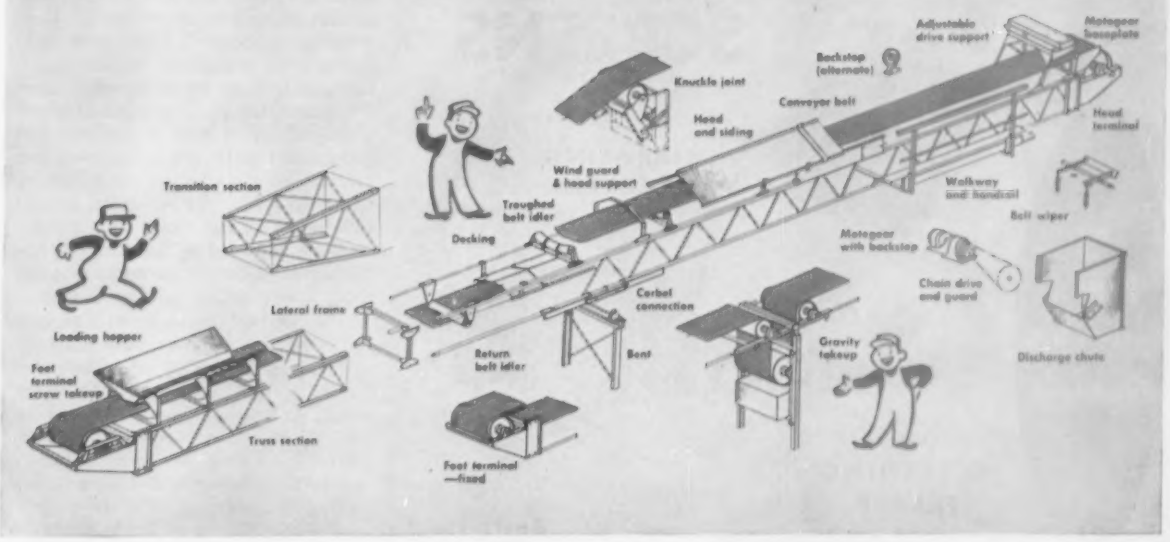
CANADA CEMENT CO., LTD., Montreal, Que., Can., has announced plans to expand the Havelock, N.B., plant of its subsidiary, Maritime Cement Co. An additional kiln is included in the plan, which will double the present annual capacity of 800,000 bbl. The $3 million expansion program is scheduled for completion before the beginning of the 1957 construction season.

Another operation of Canada Cement, the Beachville, Ont., plant, was recently put into production. The $10 million plant has a capacity of 1.6 million bbl. per year. Additions to the Montreal East plant, completed in May, increased that plant's total output from 6- to 7½ million bbl. The Fort Whyte plant of Canada Cement is also expanding, raising its annual production capacity from 3.2- to 4.7 million bbl.

Drilling Symposium

UNIVERSITY OF MINNESOTA will present its sixth annual Drilling Symposium October 11-13, 1956, at the Center for Continuation Study on the Minneapolis campus. Production drilling and blasting will be the subject matter of this year's symposium.

THESE STANDARD COMPONENTS ARE ALL AVAILABLE TO MEET YOUR INDIVIDUAL REQUIREMENTS



NOW! The advantages of engineered belt conveyors in a LINK-BELT PRE-BILT PACKAGE

easy selection

Your Link-Belt representative will help you select the best combination of PRE-BILT sectional belt conveyor components.

Standard 18, 24, 30 and 36-inch widths need no special engineering

Here's an economical, standardized belt conveyor "package" . . . ready to meet the majority of belt conveyor needs and perform dependably for years and years. It combines standard Link-Belt products with sectional truss frames and steel supporting bents.

Book 2579 has further data on Link-Belt PRE-BILT conveyors . . . with drives up to 40 hp and 24 and 42-inch truss depths. Write today, or ask for a copy at your nearest Link-Belt office.

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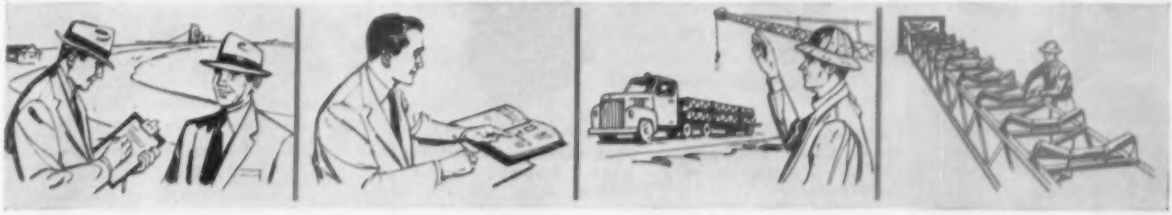
BELT CONVEYOR EQUIPMENT



prompt quotations

He will prepare a comprehensive and accurate estimate of requirements for installations that permit "on-the-ground" survey.

simplified purchase

Parts are standardized, interchangeable, all available from one supplier. Link-Belt representative can furnish all data.

quick delivery

PRE-BILT conveyors are built at nine strategic locations throughout the country and are shipped from the plant nearest you.

fast installation

Can be readily handled by your own erectors in most cases. Link-Belt can also furnish complete erection service and supervision.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 15); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

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Built for Fast, Efficient, Heavy Duty Screening

Syntron designs and builds screens for practically every screening application in many industries—mining, chemical, food, etc. Replaceable screening surfaces from 80 mesh to ¾" openings.

PULSATING MAGNET SCREENS—provide effective low cost sizing of medium tonnage materials.

GRIZZLY BAR SCREENS—increase efficiency of any operation requiring scalping or coarse screening of heavy tonnage materials.

SCREENING FEEDERS—utilize powerful electromagnetic drives to size, dewater, desludge, desilt, dedust bulk materials. Screens up to 3" materials size.

Other SYNTRON Equipment of proven dependable Quality

TEST SIEVE SHAKERS

Insure high speed, accurate sizing of test samples. Positive control of time and speed for uniformity.

A-C to D-C POWER CONVERSION UNITS

Complete, ready to operate. Capacities up to 300 kw. Practically no maintenance.

ELECTRIC VIBRATORS

For a free flow of stubborn materials through bins, hoppers and chutes

Write for complete catalogue—FREE

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LABOR RELATIONS

(Continued from page 19)

leagues.[9] This is especially so in view of the apparent supervision of their policies, exercised by Clark personally through the occasional business meetings and through the medium of Amos Clements, the office manager of Clark Construction. Rather it appears that the general managers are allowed this latitude as a matter of policy set by Clark who has the power to change this policy at any time. This conclusion is reinforced by the fact that the Employer does not contend that the three corporations are other than a single employer, though it does contend that only separate plant units are appropriate in view of the authority of the general managers over wage rates, hiring and firing of employes and the lack of interchange among employes. Certainly, where, as here, there are numerous indications that three corporations are operated as a single business entity, the Employer's own view of the matter is a material and persuasive factor in determining the final conclusion.

"The difficulty with our colleagues' position is basically, that they have confused unit considerations with jurisdictional considerations, and determined the jurisdictional issue on the basis of considerations which are more properly considered in determining the appropriate unit. The Board does not require that, in order to find that one or more corporations constitute a single employer, it must also be found that only an employer-wide unit is appropriate.[10] We admit that the considerations cited by the majority as support for its separate employer finding do indicate that a single plant rather than an employer-wide unit is appropriate, and accordingly we concur in the majority's unit finding with respect to Clark Construction. We do not agree, however, that the three corporations are not a single employer. "Accordingly, we would find that the three corporations involved constitute a single employer, and as the Employer sells products valued in excess of $50,000 outside the state of Idaho, we would assert jurisdiction over all the plants involved herein."

9. Mellody Mills, Inc. 108 N.L.R.B. 1202.

10. Vita Food Products, Inc., 102 N.L.R.B. 495; Frost Lumber Industries Division of Olin Industries, Inc. Frost Hardwood Floors, Inc.; and Frost Brand Funiture Company, Inc., 101 N.L.R.B. 659.

11. Jonesboro Grain Drying Cooperative, 110 N.L.R.B. 481. Texas Constuction Material Co., 114 N.L.R.B. No. 71.

•

CEMENT EXPORTS from Japan during 1955 climbed nearly 20 percent to 1,081,000 tons, from 904,000 tons in 1954.

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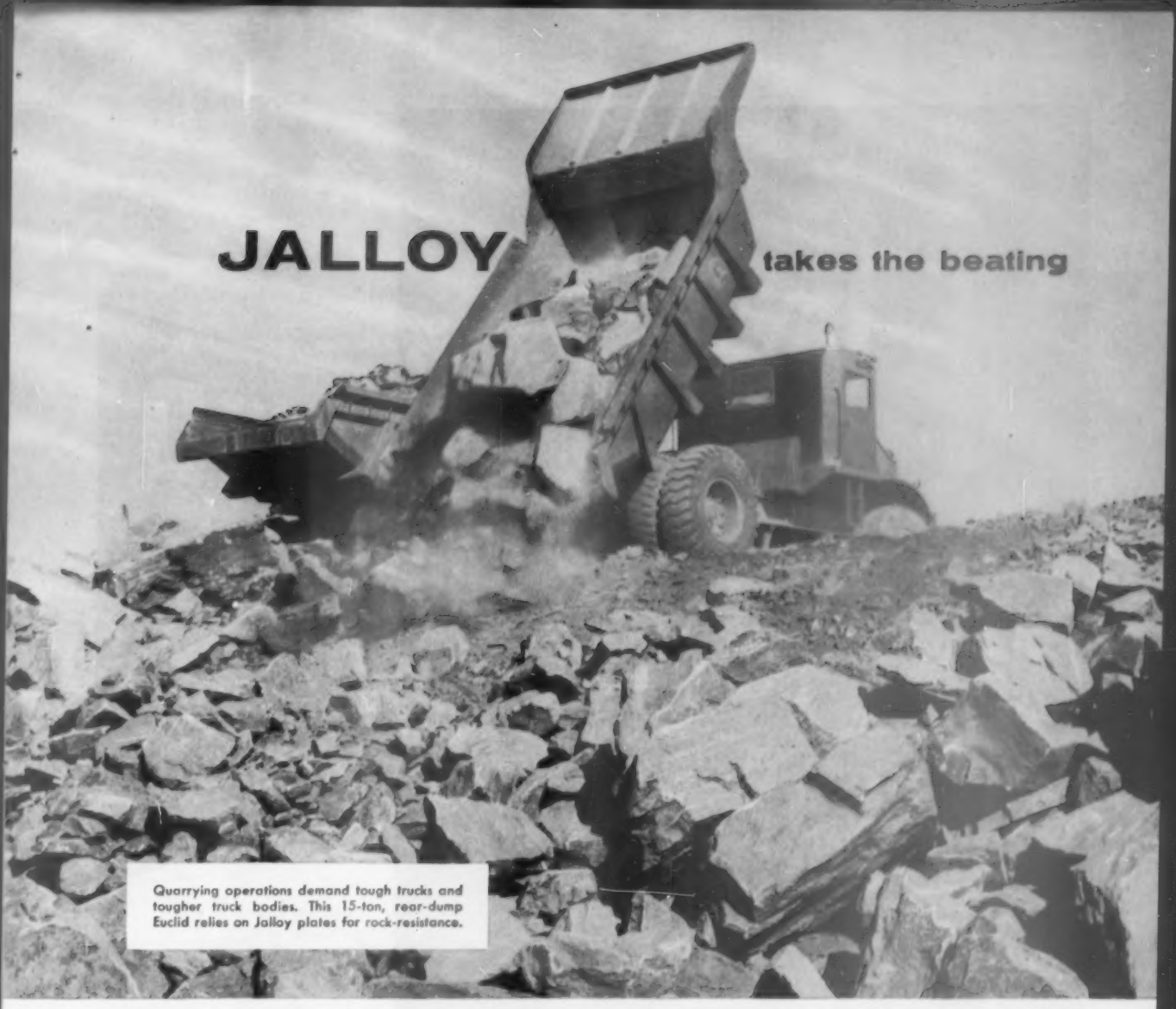
JALLOY takes the beating



Quarrying operations demand tough trucks and tougher truck bodies. This 15-ton, rear-dump Euclid relies on Jalloy plates for rock-resistance.

Jalloy heat treated steels . . .

cut maintenance—give longer wear life

Jalloy—special purpose steels that are heat treated to provide longer wear on applications where impact and abrasive conditions are severe—last 4 to 20 times longer than conventional mild steels. Furthermore, they are easily welded.

Jalloy is available in three grades:

No. 1—for applications requiring excellent formability or where a low carbon alloy steel possessing good physical properties before or after heat treatment is specified. This is an ideal carbonizing grade.

No. 3—a general purpose steel capable of being heat-treated to excellent physical properties. Compared to ordinary mild steels it offers good resistance to abrasion or wear in the as-rolled state; but when heat treated to Brinell 340 and above, optimum abrasion and impact resistance is secured.

No. 7—possesses high hardness together with good ductility or wear resistance. Excellent for spring applications as well as flat work.

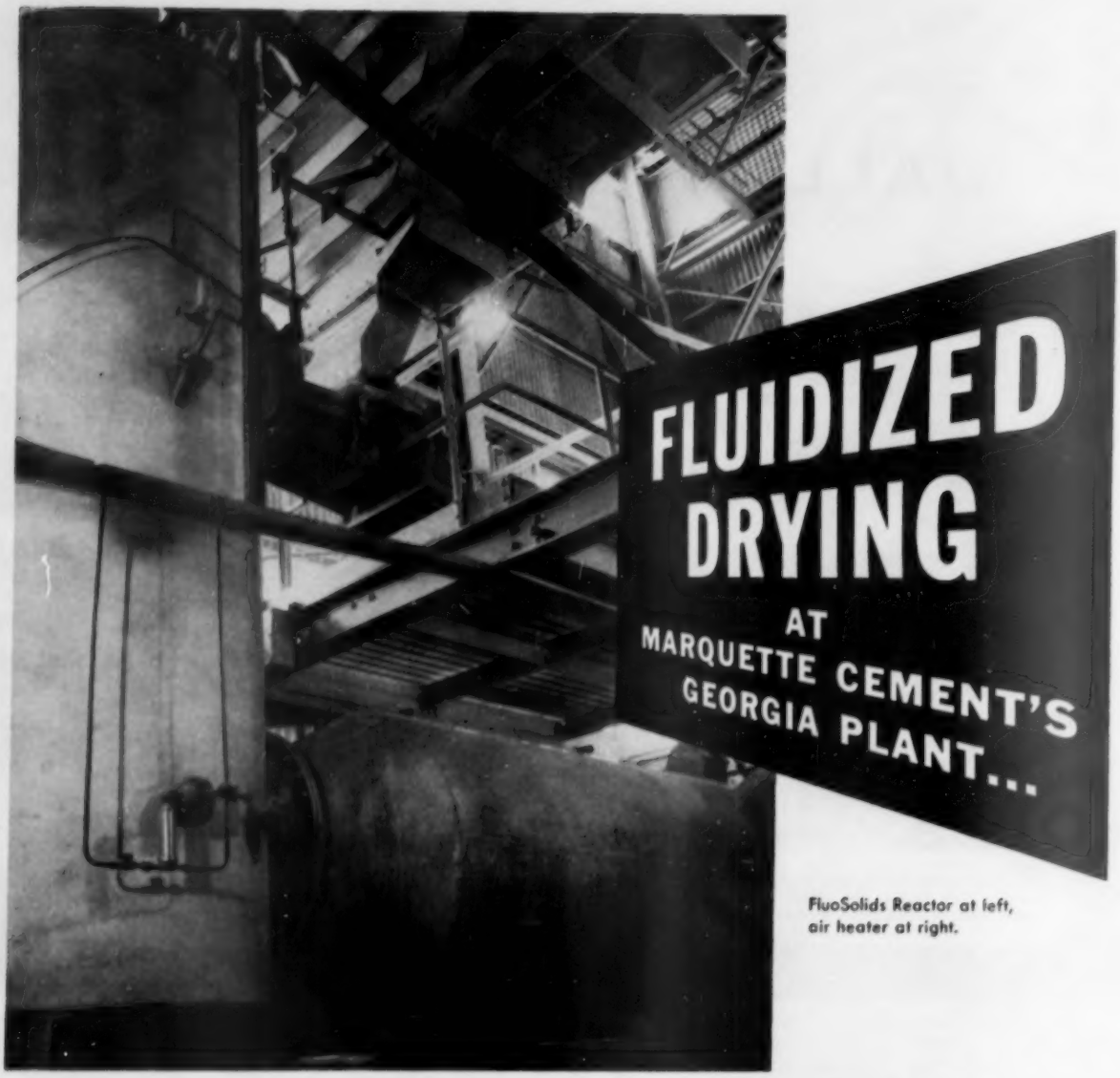
Jalloy high strength steels are available as plates, structurals, bar and small shape sections, hot rolled sheets, as well as strip and wire products.

* * *

Complete data concerning *Chemical Composition . . . Heat Treatment . . . Weldability . . . Physical Properties . . .* will be mailed to you promptly. Write today for your copy.

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH

JL STEEL



FluoSolids Reactor at left, air heater at right.

Another first for fluid techniques came about early in 1955, when Marquette Cement Manufacturing Company started up this FluoSolids System at their Rockmart, Georgia Plant. Designed to dry ¾" limestone containing 3.5% moisture, the system processes 40 tons per hour of feed to the raw mills. Compared with the conventional dryer which it replaced, the FluoSolids System has greatly reduced labor and fuel costs at the same time saving considerable floor space.

Other advantages of the FluoSolids System for drying are simplicity and ease of operation and low maintenance due to absence of moving parts in contact with abrasive dust. Start-ups and shutdowns present no problem and the system can produce a dry limestone product from which fine clay has been separated.

For dry process cement manufacturers, fluidization represents a new and better method of dedusting and drying limestone and cement rock.

For more information write for a copy of Bulletin No. 7502, Dorr-Oliver Incorporated, Stamford, Conn.

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CEMENT COOLING

(Continued from page 128)

column indicates the respective temperatures with air cooling; the dust collector being connected to take the atmospheric air induced into the separator.

For comparison, the reported mill discharge temperature preceding the air separator, in line of product flow, has been used as the separator feed temperature. Either the reported separator fines or finished cement temperature has been used to represent the separator fines temperature. Recognizing that this does not reflect the actual temperature values of the input and output of the separator in every instance, the data can still illustrate the relative temperature reduction of the separator fines with and without the application of air cooling.

The plots show that an inherent cooling effect within the separator exists and that only a relatively small increase in temperature reduction can be expected by the special application of drawing atmospheric air through the separator. However, in each instance air cooling has reduced the separator feed temperature by returning cooler tailings to the mill circuit and tending to lower the fines temperature to a greater degree. If this increased reduction of temperature will keep the maximum cement temperature within a specified limit during the grinding then such practice is justified.

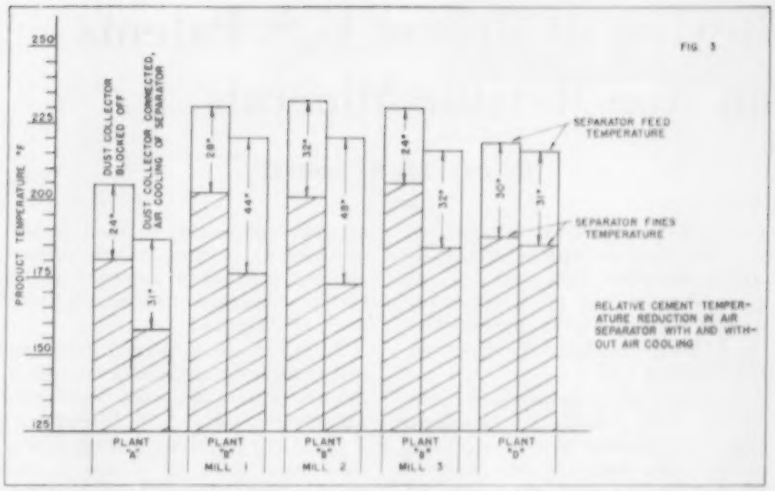

Fig. 3: Illustrating temperature reduction of cement during the period of classification in the air separator with and without the introduction of atmospheric air for cooling

●

OREGON'S MINERAL INDUSTRY in 1955 ran up an all-time record of an estimated $33,050,000, according to the Department of Geology and Mineral Industries, Portland, Ore. The upward trend was most noticeable in the industrial minerals. A continuing large-volume production for crushed stone and sand and gravel was noted, with total output approaching $22 million or almost ⅔ of the total of all mineral production for the state. Pumice producers enjoyed their biggest year, with a $200,000 production bettering the 1954 figure

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Review of Recent U.S. Patents on Non-Metallic Minerals

By OLIVER S. NORTH*

2,753,315 — Molded storage battery containers or other acid-resistant articles are made from asphalt, a fibrous material, and an acid-resistant mineral filler, such as **pyrophyllite.** (L. J. Miller. Assigned to American Hard Rubber Co.)

2,753,997 — In an improved method for froth flotation of **phosphate** rock, the siliceous froth-product resulting from flotation with positive-ion reagents is pulped with a colloidal clay; for example, **kaolin, bentonite,** or **fuller's earth,** and returned to the circuit as middlings, thus effecting greater recovery of the phosphate values. (J. B. Duke and H. W. Breathitt, Jr. Assigned to Minerals & Chemicals Corporation of America.)

2,754,067—A method and apparatus especially adapted to wet-grinding **phosphate** rock that carries carbonaceous gangue materials. A slurry containing the crude mineral and a restricted quantity of water is ground in a rod mill. (B. G. Klugh. Assigned to Monsanto Chemical Co.)

2,754,098 — Economy and efficiency of operation are claimed for a new method of underground solution recovery of **sulfur.** (R. V. Heinze. Assigned to Submerged Combustion Company of America, Inc.)

2,754,101—An apparatus and method for machine mining **sylvinite, trona, gypsum,** and other relatively soft ores occurring in thin seams. (J. G. Nutt and R. G. Haworth. Assigned to Potash Company of America.)

2,754,190 — A process for making non-agglomerating superphosphate fertilizer by adding to the **phosphate** rock-sulfuric acid slurry a sulfonic acid solution. (E. R. Littmann. Assigned to Esso Research & Engineering Co.)

2,754,191 — An improved process for defluorinating **phosphate** rock involves coating the ground particles of phosphate rock with controlled quantities of **bentonite** and finely ground **silica** preceding high-temperature calcination of the material. (C. A. Hollingsworth and J. C. Williams. Assigned to Smith-Douglass, Inc.)

2,754,220 — This improved fully-hydrated **gypsum** plaster mold possesses the strength and permeability to gases comparable to sand molds, and also has a very smooth surface and high dimensional accuracy. (G. R. Gardner. Assigned to Aluminum Company of America.)

2,754,235 — A thermal insulating unit is made by laminating together a fibrous, organic insulation board with a **gypsum** board. (W. W. Wesner.)

2,755,181 — Boron is added to ferrous metal melts by placing in the ladle a flux composed of alumina, **lime,** titanium-zirconium oxide, **borax,** and **fluorspar.** (E. Spire. Assigned to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude.)

2,755,207 — The burning characteristics of a cigarette paper are markedly improved by incorporating therein a siliceous catalyst, preferably finely ground acid-activated **clay.** (W. G. Frankenburg. Assigned to General Cigar Co., Inc.)

2,755,212 — Among the ingredients used in a glare-reducing safety glass are **sand, limestone, soda ash,** and **aplite.** (W. F. Brown. Assigned to Owens-Ford Glass Co.)

2,755,213—An improved laminated paper for wrapping food products is made by including as the innermost lamina a **diatomite**-filled absorbent paper, which will effectively absorb oils and greases. (O. H. Hedstrom. Assigned to Hartford City Paper Co.)

2,755,534 — Flameproof, woven fabrics suitable for theater curtains and the like are made by coating woven fabric bases made of **asbestos** and cellulosic fibers with a flameproofing composition of antimony oxide and a thermoplastic resin. (I. Barnet. Assigned to Johns-Manville Corp.)

2,756,000 — Insulating batts or panels made of **asbestos, mineral wool,** or exfoliated **vermiculite,** or exfoliated vermiculite loose fill, are used in a hollow floor insulating system designed for installation in house trailers. (R. R. Anderson.)

2,753,252 — A process is described for obtaining fertilizer from **phosphate** rock by treating it with nitric acid, filtering, evaporating the filtrate, heating the residue, mixing the residue with liquid anhydrous ammonia, filtering the mixture, and drying the filter cake. (M. D. Barnes. Assigned to Monsanto Chemical Co.)

2,753,253 — A process is described for recovering fluorine from **phosphate** rock by a method of successive calcination concentration of the fluorine content from defluorinated phosphatic raw material, and then recovering fluorine gas from the enriched solution. (C. A. Hollingsworth. Assigned to Smith-Douglass Co., Inc.)

2,753,314 — Aminated **bentonite** is the preferred gelling agent in a vinyl resin - plasticizer composition. (E. T. Severs and A. C. Frechtling. Assigned to Union Carbide & Carbon Corp.)

2,756,035 — A method of processing and using sea water or other saline waters in the underground solution mining of **sulfur.** Principal advantage is a marked lessening of scale deposition on the hot heating surfaces of the equipment. (B. A. Axlerad and V. H. Brogdon. Assigned to Freeport Sulphur Co.)

2,756,135 — Herbicidal urea compositions can be effectively dispersed in finely comminuted **talc, pyrophyllite, attapulgite, diatomite,** or exfoliated **vermiculite.** (N. E. Searle. Assigned to E. I. du Pont de Nemours & Co.)

2,756,159 — An improved, acoustical, fireproof composition adapted to application to sheet-metal panels is made of sodium hydroxide, water glass, and exfoliated **vermiculite.** Acoustical properties are maintained by regulating the water content of the composition so that the surface of the finished product remains relatively soft when in use. Although exfoliated vermiculite is usually preferred, numerous other organic or inorganic materials, including **pumice, asbestos, mineral wool,** and expanded **perlite,** can be used instead. (F. E. Kendall and P. Golar. Assigned to The E. F. Hauserman Co.)

2,756,173 — **Graphite** is used as a preferred filler in thermoplastic synthetic resin sheet articles having surfaces made conductive to electricity to certain predetermined degrees. (J. B. Eisen, P. R. Girardot, E. G. Paquette, and S. E. Rohowetz. Assigned to Bjorksten Research Laboratories, Inc.)

2,756,207 — 2,756,208 — In a process for preparing the large quantities of water required for underground solution mining of **sulfur,** sea water or other saline or waste waters are heated in a two-stage indirect heat exchanger. The scale-forming saline compounds present are deposited in a soft layer during the first stage, and the water in the second stage can then be effectively heated to a higher temperature. (B. A. Axelrad. Assigned to Freeport Sulphur Co.)

2,756,981—The tendency of **portland cement** raw material mixtures to

(Continued on page 160)

*Copies of United States patents are available from Commissioner of Patents, Washington 25, D. C., at a cost of 25¢ each.

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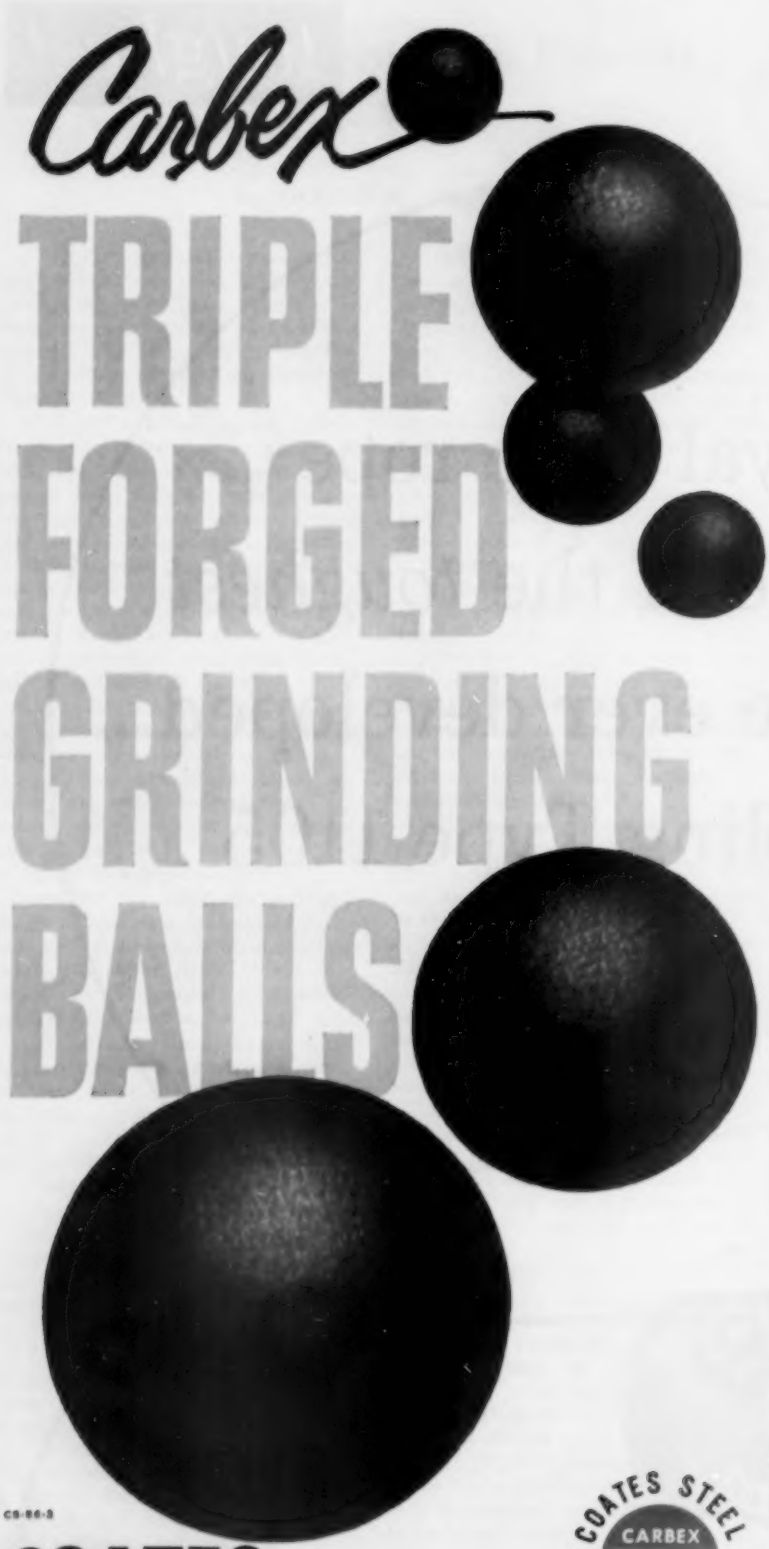

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agglomerate during preheating is eliminated in an improved, cyclone-type apparatus that utilizes the heat contained in exit gases from the rotary kiln. (to F. Muller. Assigned to Klochner-Humboldt-Deutz Aktiengesellschaft.)

2,757,075 — **Sulfur** containing appreciable percentages of insoluble sulfur can be effectively stabilized by treatment with certain organic compounds which have an olefinic linkage and are capable of forming free radicals. (to J. N. Haimsohn.)

2,757,095—Foundry **sand** can be improved by the addition thereto of a mixture of wood flour and a hydrocarbon liquid solution of plasticizable resin. (to H. H. Johnson. Assigned to Walter Gerlinger, Inc.)

2,757,096—An improved masonry mortar sand mixture is composed of about 59 percent **sand;** 20 percent **diatomite** or **bentonite;** 20 percent an active volcanic pozzolanic material, such as **pumicite**, **rhyolite,** or calcined **tuff;** and small quantities of diethylhexanol, a sodium salt of a condensed mononapthalene sulfonic acid, and the sodium salt of dodecylbenzene sulfonate. (to D. Tiersten.)

2,757,098—Mineral substrate materials used for manufacturing surface-modified, finely divided siliceous powders include **asbestos, halloysite, attapulgite, hectorite, kaolin, bentonite, mica,** and **vermiculite.** The powders can be used as selective adsorbents for proteins, amines, and dyes; as fillers for polymeric materials; and other industrial purposes. (to K. L. Berry, R. M. Joyce, Jr., and J. E. Kirby. Assigned to E. I. du Pont de Nemours & Co.

2,757,118—Mineral powders suitable for carrying phosphate insecticides include **fuller's earth, diatomite, bentonite, pyrophyllite,** and **talc.** (to W. T. Dye, Jr. Assigned to Monsanto Chemical Co.)

2,757,119—**Pumice, bentonite, fuller's earth, talc, clay,** or **lime** can be used as the carrier for a fungus-prevention composition. (to G. E. Bennett and A. H. Schlesinger. Assigned to Monsanto Chemical Co.)

2,757,120 — Insect-repellent dusts are compounded of esters of pyridine dicarboxylic acids and finely ground **diatomite** or **talc.** (to N. J. Leonard. Assigned to Phillips Petroleum Co.)

2,757,124—Ground **talc** is used as an additive in medicinal tablets. (to J. E. Wolff. Assigned to Merck & Co., Inc.)

2,757,159 — A moisture-proofing composition for application to porous masonry comprises **portland cement, lime,** calcium chloride, titanium dioxide, and a suitable resin. (to A. I. Hor-

(Continued on page 162)

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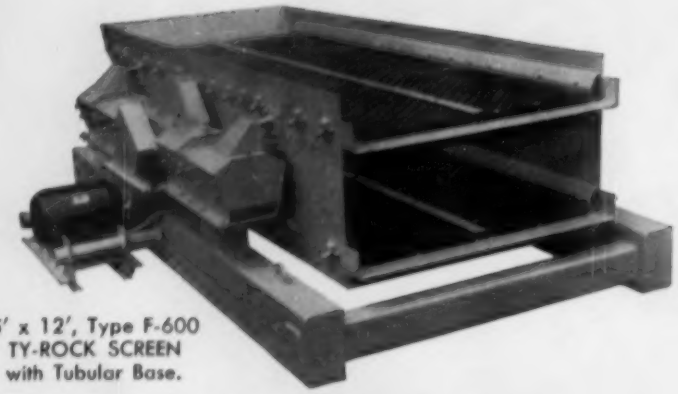

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U. S. PATENTS

(Continued from page 160)

mats. Assigned to Sta-Dri, Inc.)

2,757,160—An alkyd molding composition from which water-resistant articles can be made utilizes **kaolin** as the preferred filler material. Other minerals, such as **wollastonite** or any of the members of the **asbestos** group, can be used instead of kaolin. (to T. F. Anderson. Assigned to Allied Chemical & Dye Corp.)

2,757,426 — Dimension-stable fibrous liners for molten metal dies or molds can be made by accreting **asbestos** fibers onto a screen, pressing or rolling, and then applying coating materials. If desired, fillers such as **gypsum** plaster or **graphite** can be added to the composition. (to J. B. Brennan.)

2,757,796—As a means of improving froth flotation separation of values from **potash** ores, the clays and slimes content of the flotation pulp is rendered inactive towards the aliphatic amine reagent by precipitating a metal hydroxide in the brine prior to introducing the reagent. (to E. A. Schoeld, J. M. Fritschy, and R. R. Nelson. Assigned to Potash Company of America.)

2,757,921 — In a multiple-stage process, **lime** or **portland cement** clinker is produced by heating pulverulent raw materials in gas streams of progressively higher temperatures. This method represents a radical departure from current practice. (to L. Petersen. Assigned to F. L. Smidth & Co.)

2,758,010—The brightness quality of Georgia **kaolin** to be used in high-quality paper can be improved by heavy bleaching with a hydrosulphite at a pH below 3.2, then adjusting the pH to the range 5.5 to 8.5, and separating the gray fraction from the slurry by sedimentation. The residual fraction has a markedly better brightness quality. (to B. W. Rowland. Assigned to Georgia Kaolin Co.)

2,758,033—An artificial structural stone masonry building unit is made by mixing **limestone** fines, **portland cement,** and limited quantities of water and crushed siliceous **sand.** Other hard mineral materials, such as **granite, perlite, marble, slate,** or **shale,** can be used instead of the sand. The product is sold under the trade name "Holiday Hill" stone. (to H. P. Burney, Jr., and J. L. Felder.)

2,758,038 — A composition comprising a pigment, a water-soluble hydrate of a silicate, and a powdered anhydrous alkali metal silicate is applied to mineral **roofing granules** to produce a continuous color film, free of pinholes and blisters. (to A. P.

(Continued on page 164)

B.F.Goodrich

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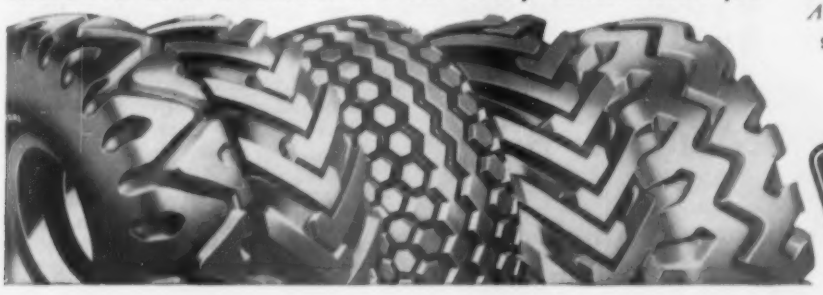

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U. S. PATENTS

(Continued from page 162)

Lentz, S. T. Rudish, and A. Szabo. Assigned to The Patent & Licensing Corp.)

2,758,043—Pipes are heat insulated by wrapping them with asbestos insulation paper on which has been spread heat-resistant fibers, for example, **asbestos** or **mineral wool.** (to R. E. Cryor.)

2,758,051-054—Suitable inert mineral carrier materials for fungicidal dust compositions include finely comminuted **mica, talc, pyrophyllite,** and **clay.** (to A. E. Smith, G. E. O'Brien, and A. Bornmann. Assigned to United States Rubber Co.)

2,758,096—Alkali metals, especially sodium, can be effectively and safely dispersed in a liquid hydrocarbon medium containing in suspension a small percentage of **activated clay.** (to E. F. Hill. Assigned to Ethyl Corp.)

2,758,335—An apparatus for producing **mineral wool** in which the fibers are relatively long and of approximately equal length. (to E. R. Overman.)

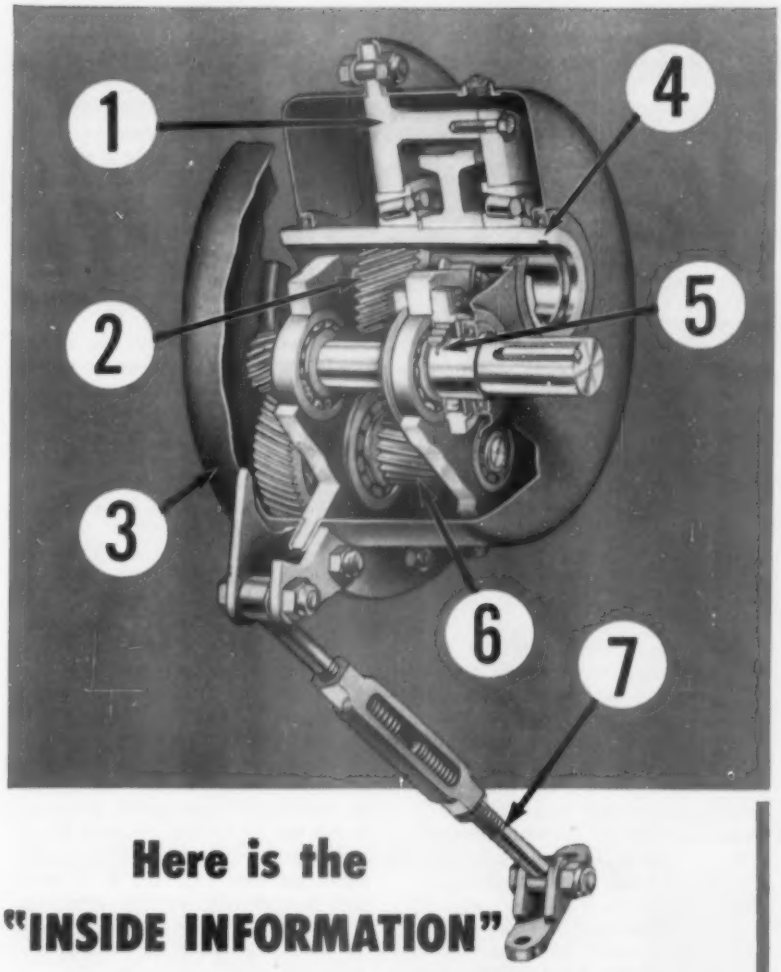
2,758,445—An apparatus and method for rapidly and simultaneously cooling and dewatering **sand** to be used as concrete aggregate. (to W. E. Saxe. Assigned to The Conveyor Co., Inc.)

2,758,671 — A filtering medium adapted to use in reverse jet filtering units is made by disposing a core layer of inorganic fibers, for example, **asbestos** or fiberized **blast-furnace slag,** between layers of a fabric that is resistant to high temperatures, such as "Orlon." (to L. Silverman and R. A. Davidson.)

2,758,714—An improved apparatus for the flotation concentration of **phosphate** rock with a minimum production of slimes. This object is accomplished by subjecting the flotation pulp to effective aeration with a minimum of agitation. (to C. A. Hollingsworth. Assigned to Smith-Douglas Co., Inc.)

2,758,913—An apparatus and method for recovering elemental **sulfur** from hydrogen-sulfide containing gases through direct oxidation of the hydrogen sulfide by means of air or other gases containing free oxygen. (to F. G. Pearce. Assigned to Stanolind Oil & Gas Co.)

2,759,813 — Improvements in the beater saturation process of preparing sheet materials from **asbestos** fibers and rubber latex. Uniform distribution of the binder solids is obtained by addition to the asbestos slurry of a small percentage of a water-soluble polycarboxylic acid. (to D. A. Feigley, Jr. Assigned to Armstrong Cork Co.)



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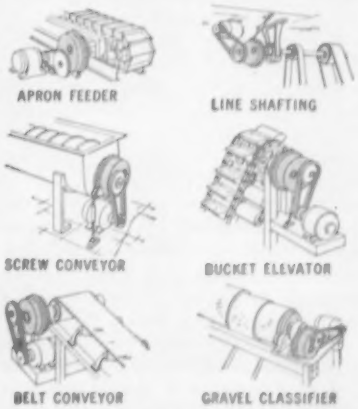

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German Technicians

Discuss Cement Developments

By B. M. PEARSON*

SOME IMPORTANT ADVANCES in equipment and cement processing were revealed in papers presented before the 1955 meeting of the German Cement Manufacturers. Summaries of these papers follow.

Determination of the Particle Size of Cement and Dust by the Measurement of the Light Absorption by F. W. Locher:

A new process of determining by optical means the particle size distribution in pulverant substances is based on sedimentation in an inert dispersion medium. It employs the well known Stokes formula. A process was described by O. Telle, based on the work by J. R. Musgrave and H. R. Harner, in which the concentrations were optically determined. It was assumed that the shadow thrown by the particles is proportional to their concentration. If the fluid column is illuminated by a light source then the weakening of the light passing through can be used for the measurement of the concentration of the sedimented particles at this position. The transmitted light is measured photo-electrically.

According to the work by Musgrave and Harner, it is not necessary to determine the absolute concentrations. It suffices for turbidimetrical particle size determination to ascertain the relative concentrations by a suitable measurement. This process differs from the Wagner turbidimetric surface determination as in this method the absolute concentrations are ascertained. In addition, for evaluation of the sedimentation analyses, the optical influences, which vary with the different materials, also are considered, and the accuracy of the test method is said to be accordingly increased.

Advantages of this optical method as compared with the pipette method are as follows: (1) the pipetting is dispensed with; (2) the measurements can be undertaken after shorter sedimentation periods; (3) a centrifuge can be used.

The optical determination method requires only about half the time of a pipette analysis. Accuracy is obtained to within 4 to 5 percent. The errors, as compared with the pipette method, are no greater with the determination of very small particle sizes. Above 40 microns, however, the pipette method is to be preferred.

The process was tested out on suspensions of chromite, quartz, cement and brick clay. Cement was suspended in a mixture of cyhexanol/amyl alcohol in the ratio of 9:1 in carrying out this test.

Determination of Mill Fineness by Hand and Machine Sieving by A. Menke:

Some important fundamental considerations must be examined in making a careful, reproducible sieving analysis. Among other things, one has to ensure that each sieving is carried out right to the end and with a minimum sieve residue portion. The dust in enclosed sieving sets is a particularly disturbing factor. To remove these dusts, a vacuum dust remover was developed to achieve better sieving results.

A new sieve machine also was described with results corresponding to standard specified hand sieving. This machine was constructed by the German firm of Haver and Boecker. It comprises an electro-magnetic laboratory sieve (type designation "EML") which possesses an electro-magnet as the driving source for the movement of the sieve bottoms. The test sieve edges, both horizontal as well as vertical, are vibrated in short oscillations (up to 3000 per min.), and a rotary movement is imparted to the material being sieved. Each sieve set is provided with a suction apparatus. Four test sieves with 4900 meshes per sq. cm. or two test sieve sets with sieves of 900, 4900 and 10,000 meshes per sq. cm. can be used. The sieving duration for this first arrangement is 10 min.; for the second arrangement it is 15 min.

Analysis Sifters (after Holderbank) by E. Spohn:

The known-analysis sifter, according to Holderbank, was developed in an improved form by the German firm, Alpine of Augsburg. Definite separating limits can be set up by various nozzles (15 microns, 30 microns, 45 microns). The amount of material supplied to the apparatus amounts to 5 g. No superintendance is necessary during the sifting. As an example, for the duration of an air classification at 45 microns it was stated that 5 g. of sieve material was screened in about 25 min. This analysis sifter is naturally not suited for continuous operation. The improved form which is produced by the Alpine concern is provided with four different nozzles for the separating limit range of 18 to 45 microns. The reproducibility of the sifting is designated as very good.

Physico-Chemical Processes in Rotary Kilns with Consideration of the Long Kiln by F. Koeberich:

Avoidance of ring formation may be regarded as one of the most important problems in rotary kiln operation. Besides this question, the author discussed the results of investigations on a 135 m. long kiln (F. L. Smidth) with a daily production of 500 to 600 tons (theoretical). The kiln is characterized by good preheating and a good dehydrating. The throughput time of the feed material with a revolving period of 75 sec. per revolution was measured by the addition of copper compounds to the slurry and analytical determination of the copper as copper tetramine at different points in the kiln. The throughput time through the de-watering zone amounted, according to this test, to 90 min.; through the reaction zone 270 min.; through the clinkering zone (4.5 m.) to 12 min.; and through the cooling zone (including run-out zone of one meter) to 20 min. The clinker left the kiln at 1250 deg. C.

The waste gas temperature amounted to 120 deg. C. with preheating and the insertion of a chain zone and cross in the kiln. The excess air number was located at 1.5 (corresponding to 7 percent oxygen in the waste gas). The temperature at the cross was measured at 620 deg. C. According to this, it was a question of a mild drying. Up to the cross, there must still be about 2 percent moisture contained in the raw material. Avoidance of hot dust is important as it causes rapid drying. For these reasons further kiln insertions should be retained (besides the above-mentioned chain zone and the cross).

The strength and the attrition of the granules formed was ascertained. For the determination of the strength, a hammer with a variable shot-filling was used. The tests showed that the strength was greatest in the 600 deg. zone. Both before and after, the strength again fell off. The attrition was determined in a porcelain mill without grinding media. After a sieving the raw granules (4800 mesh sq.

(Continued on page 168)

*Saxonhurst, North Bank, Hassocks, Sussex, England.

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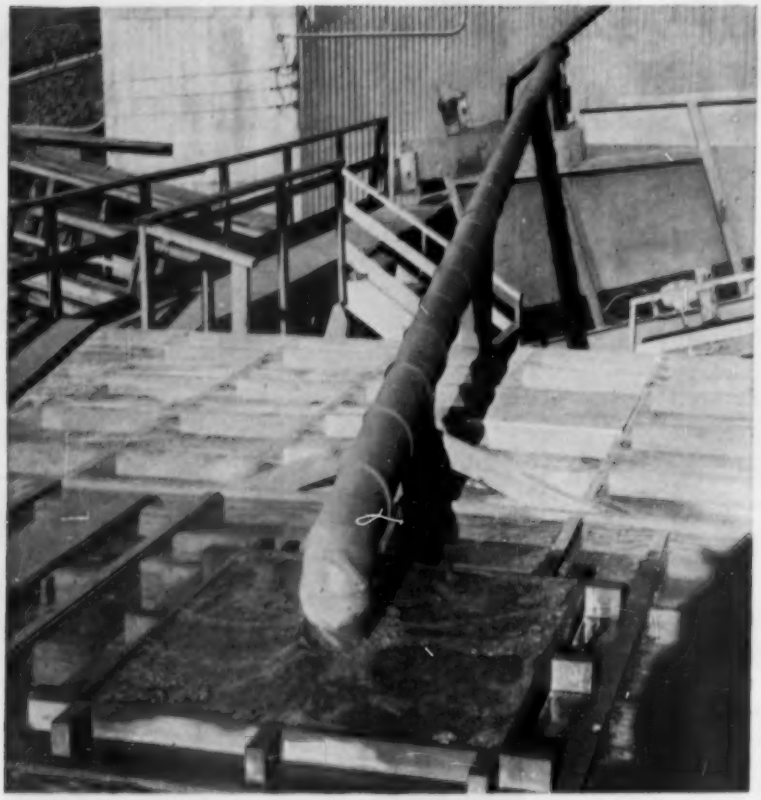

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cm.), there was shown to be large amounts of dust.

A phenomenon which has not yet been explained is the exothermic clinker effect, which, according to the author, occurs in the form of a "glow phenomenon" and is estimated at 30 to 40 WE per kg. It is caused apparently by a break-down of the surface. An amorphous-disperse condition can contain latent combined energy. Molecular aggregations recrystallize suddenly on heating. This leads to a reduction of the surface. The vitreous condition is mentioned as analagous to this, which contains latent combined heat of fusion, which can be suddenly freed.

Inclusion of MgO in Clinker Minerals by Dr. Mueller-Hesse:

The occlusion of foreign ions or molecules in crystals can be a result of defective-arrangement phenomena or can be ascribed to mixed crystal formation. With the occlusion of magnesium oxide in clinker minerals, the anion lattice remains retained. In the cation lattice a statistical distribution is present. Gehlenite and Askermanite form a continuous mixed crystal series. If the aluminum is replaced by magnesium, then a widening of the lattice occurs but a contraction, on the other hand, occurs if silicon enters in place of the aluminum.

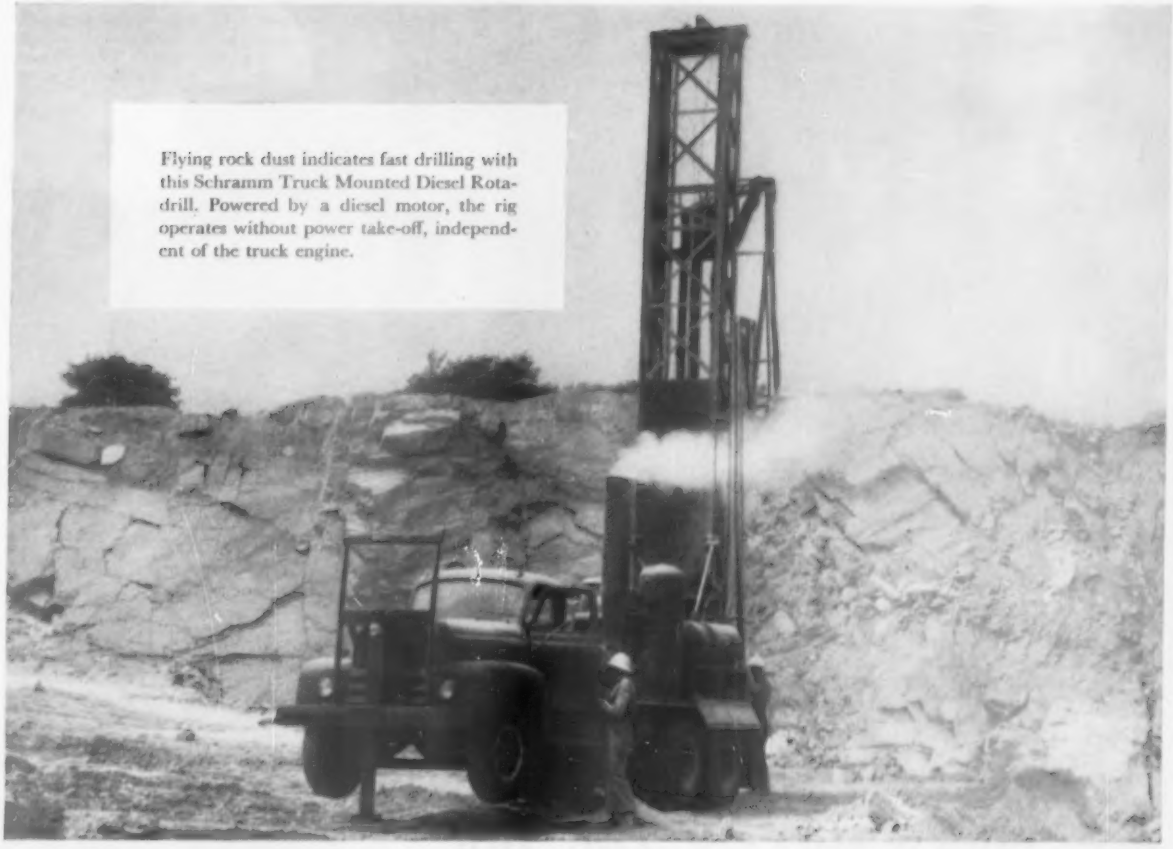
The dicalcium silicate (C_2S) is a very densely packed mineral. An inclusion of MgO is not possible.

The tetracalcium - aluminateferrite (C_4AF) forms a layer lattice, by which an inclusion MgO is possible. It can absorb up to 2 percent of MgO and assumes with this a green color.

The tricalcium aluminate (C_3A) is also in the position of occluding MgO. It can be observed that up to 2.5 percent of MgO can be taken up by this clinker material.

Sand and Gravel Report

NATIONAL SAND AND GRAVEL ASSOCIATION has issued a report, prepared by Kenneth E. Tobin, Jr., associate executive secretary, on commercial sand and gravel production and value in 1955, which attempts to measure the contribution of the industry to the national economy. Six tables enumerate (1) Sand and Gravel Production and Value in 1953, 1954, and 1955; (2) Methods of Transportation of Sand and Gravel in 1954 and 1955; (3) Consumption of Sand and Gravel in 1955; (4) Sand and Gravel Production, Value and Type of Transportation in 1955, by States; (5) Consumption of Sand and Gravel in 1955, by States; and (6) Distribution of 1955 Sand and Gravel Production by Size of Company.



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Firestone Super Mileage Lug tires have 60% deeper tread to give you more low-cost miles. More than that—they are built with husky, Safety-Tensioned *Gum-Dipped*® cord bodies. This exclusive Firestone process gives a stronger tire body and makes it possible to get more retreads on every tire.

Any way you look at it, you'll save money with Firestone Super Mileage Lug tires! If you operate dump trucks, cement mixers, logging, mining or any other heavy-duty trucks, it will pay you to contact your Firestone Dealer or your Firestone Store now for the best deal you ever got on the longest wearing, most dependable tire ever built for on- and off-the-road performance!

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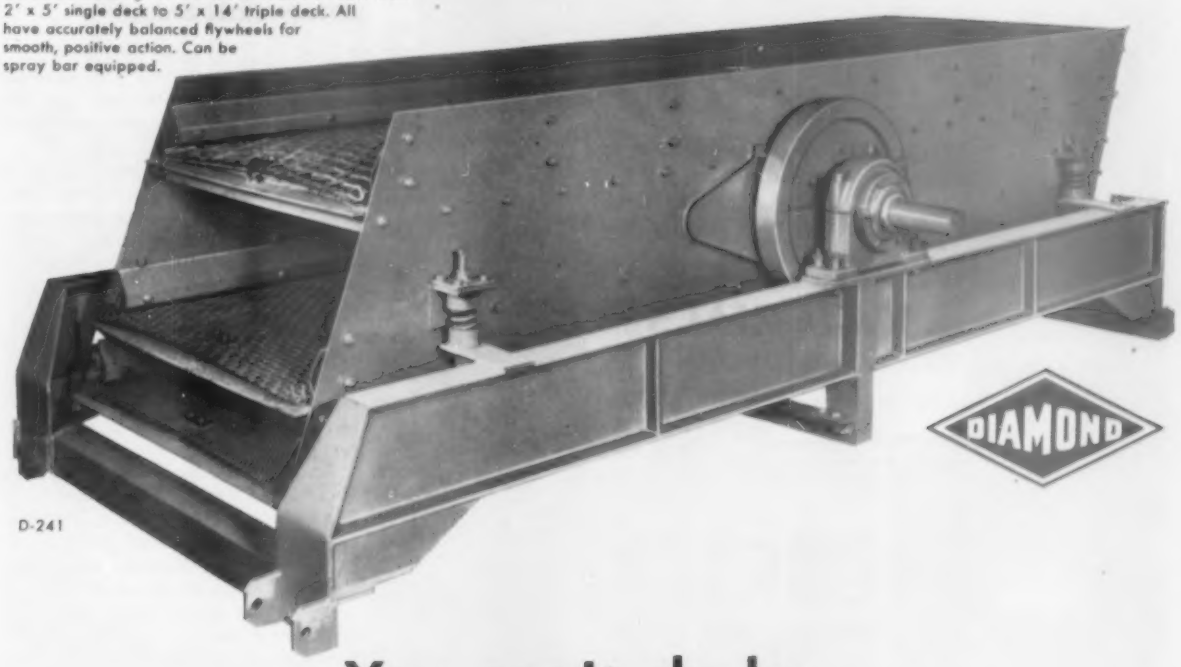

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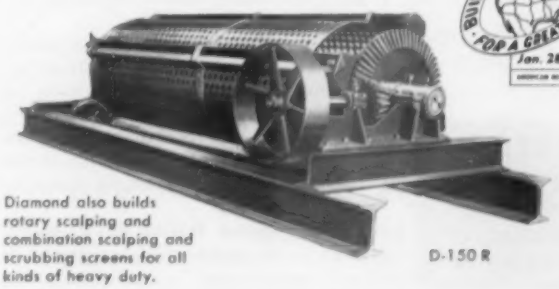

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ROTARY KILN CAPACITY

(Continued from page 86)

equipment. This saving was attained through better combustion and by taking advantage of latent equipment capacity.

Deficiency of air for combustion is extremely wasteful when burning fuel. This shows up as CO in the exit gases, and by gray or dark gases coming from the stack. The carbon in fuel when burned to completion (CO_2) yields 14,550 B.t.u. per lb. The same carbon burned partially (CO) yields 4350 B.t.u. per lb. Good results can be obtained by visual inspection of the exit gases, and knowledge of the operation gained by the use of analyzers, portable or fixed.

Another example is a kiln operating at a higher level, but still capable of improvement. Exit gases at 1200 to 1400 deg. and excess air present indicated better fuel burning possibilities. Since the effect of excess air within a certain range above small amounts is to increase exit gas temperatures, it was apparent that this condition could be improved. More fuel could be burned with the same draft conditions. Since the losses through shell radiation and other sources will change but little with higher firing rates, an improvement in fuel usage was possible. In any case, a higher output rate, even at equal fuel consumption, is most worthwhile due to its weight in offsetting fixed charges and operating costs.

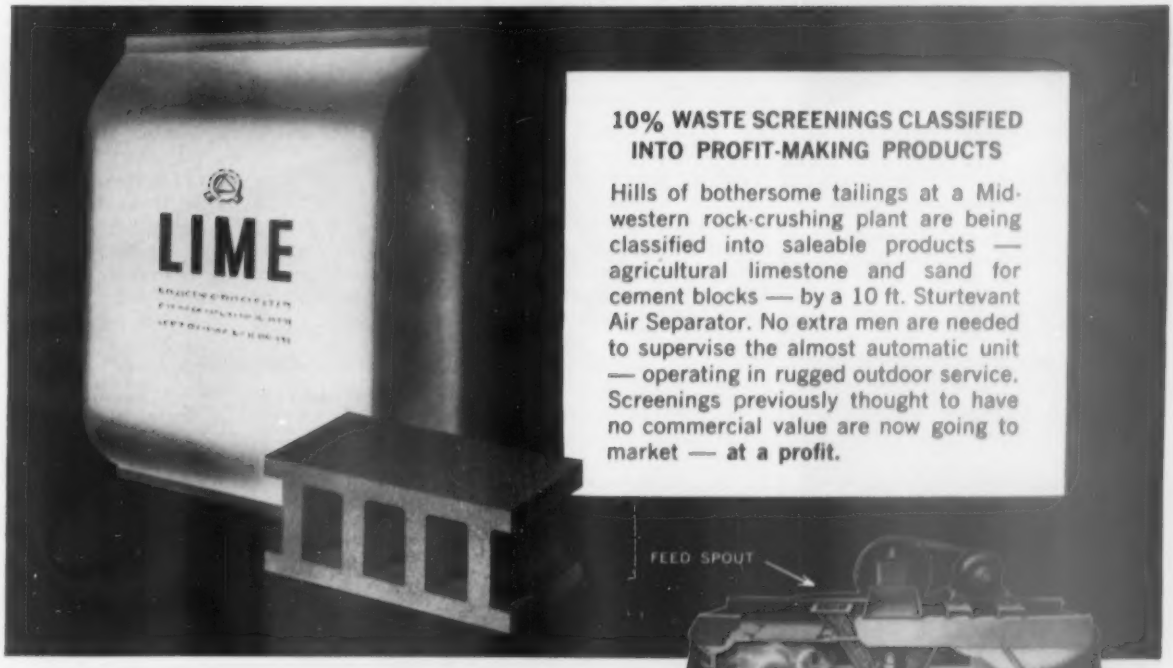
For profitable and satisfactory operation, advantage must be taken of equipment possibilities in a competent and alert manner. Fuel burning capacity of a kiln determines the output rate that can be reached. Also, the output standard of a kiln in tons per day does not necessarily indicate the success of the operation as a whole. Actually, the number of days the standard is achieved over any given period of time is the significant factor. For example, a kiln producing 300 t.p.d. for 22 days out of 30 will produce 6600 tons of lime. The remaining days may be consumed in down time for relining, scale removal or repairs. Profitable operation approaches 30 days lime production out of 30.

When coal is used, select the source of the fuel with care. Aside from selecting the type of coal — such as medium or high volatile bituminous — ash content and its characteristics are most important. Check into the chemical analysis and softening temperature of the ash.

An essential feature of a quality lime is its appearance; i.e., the dark

(Continued on page 174)

Tailings Go to Market - Separated by Sturtevant



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Hills of bothersome tailings at a Mid-western rock-crushing plant are being classified into saleable products — agricultural limestone and sand for cement blocks — by a 10 ft. Sturtevant Air Separator. No extra men are needed to supervise the almost automatic unit — operating in rugged outdoor service. Screenings previously thought to have no commercial value are now going to market — **at a profit.**

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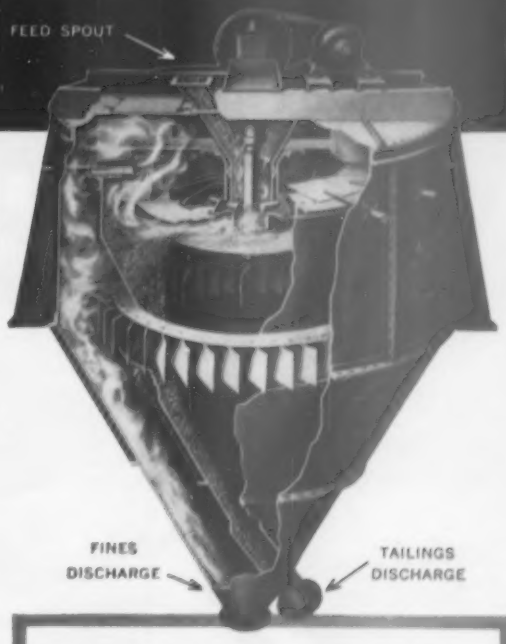

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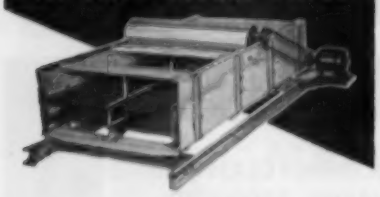

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coating or condition of the outside of the lumps. This is important to consumers who desire a milk of lime free from black specks. Lime can be burned so that it has the color of black walnuts, or it can be white.

Color of lime is largely a result of the coal ash, the most effective component of which is iron. Softening temperature of the ash also is a factor. Here are analyses of four coals:

Coal	Ash	Fe_2O_3	Ash Softening Temperature
A	7.98	8.97	2650
B	8.00	10.53	2440
C	7.16	42.91	2330
D	7.50	15.20	2665

Coal "C" would make a dark lime and coal "A" would make a light colored lime. The other two—"B" and "D"—would make a colored lime that would be neither dark nor white. This evaluation does not contemplate the degree of burning, except to consider it as being on a high level. Actual results in producing lime, as shown by color and characteristics of the ash from the coal used, are listed in Table 2.

Dark lime will be produced, regardless of degree of burning, when using a coal with high Fe_2O_3 content and low A.S.T. (ash softening temperature). It is possible to produce lime burned to a condition where core is still present and have a dark coating on the lime. Harder burning with this same coal does not make the coating any darker, but does make the coating thicker. Generally this dark coating on lime is very thin and amounts to only a color on the exterior. Where

(Continued on page 176)

Table 2: Lime Color vs. Coal Ash

Color of Lime	Coal Ash	Ash-Fe_2O_3	Ash Softening Temperature
White	4.7%	6.1%	2940 F.
White	10.1	4.0	2950
White	10.7	8.7	2920
Light	5.0	9.1	2520
Light	4.3	10.6	2570
Light	4.3	10.6	2740
Light	8.8	11.8	2750
Light	7.4	12.9	2840
Light	8.1	14.4	2783
Dark	6.6	22.6	2150
Dark	14.1	25.1	2520
Dark	—	37.9	2170
Dark	—	32.9	2170

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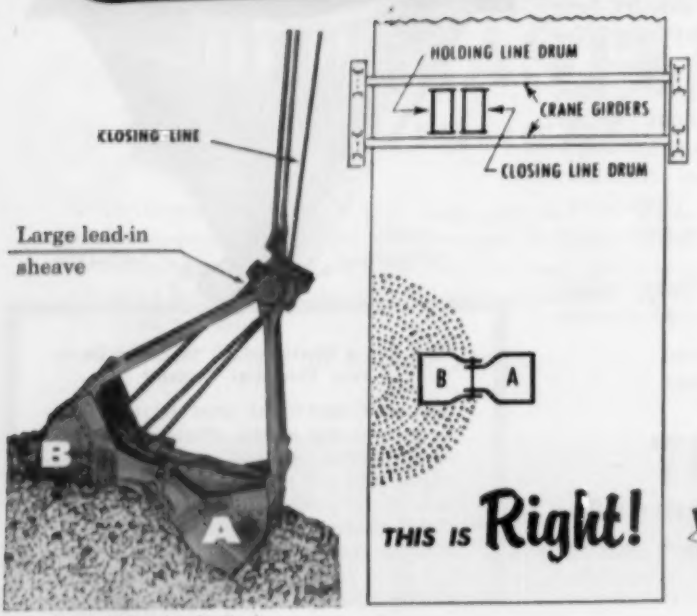

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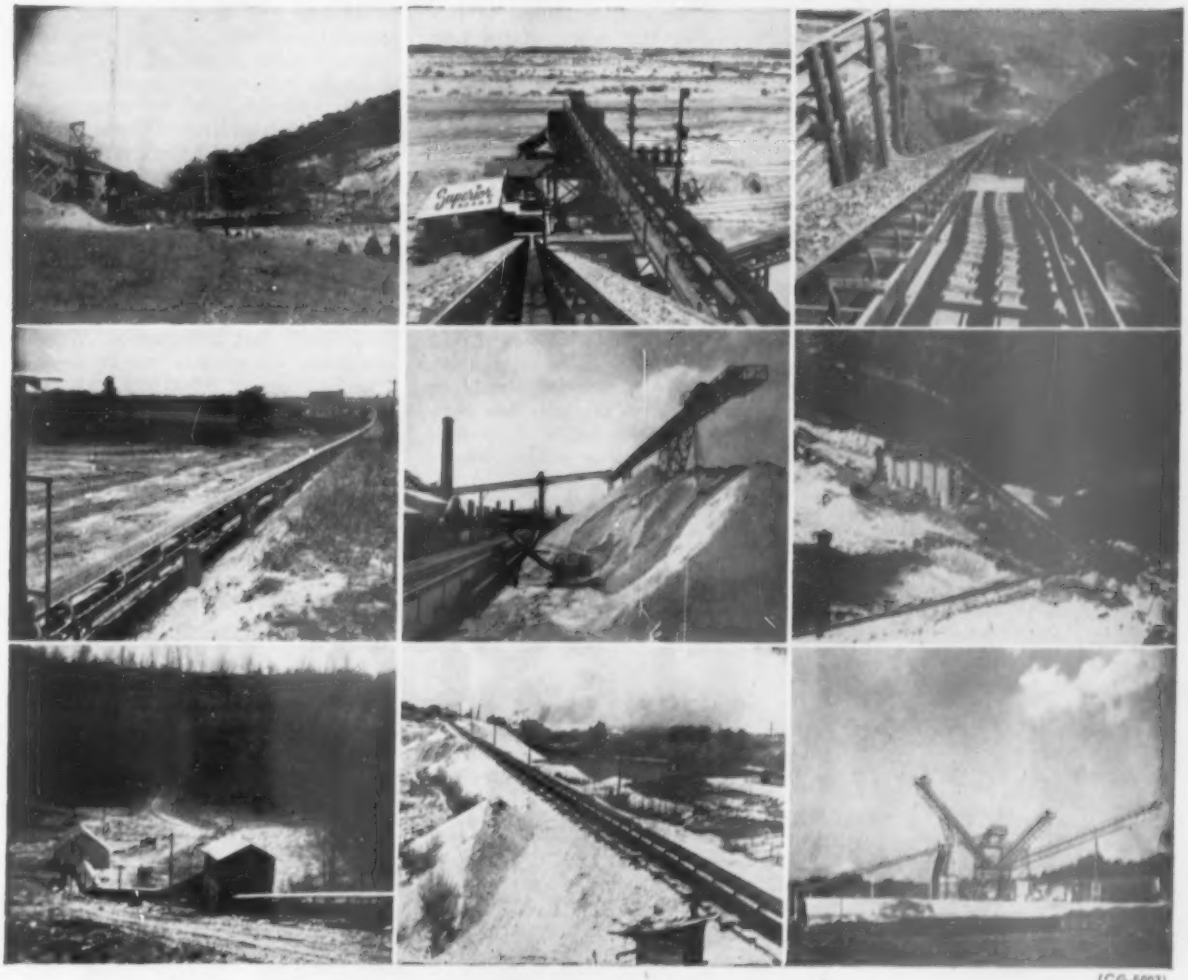

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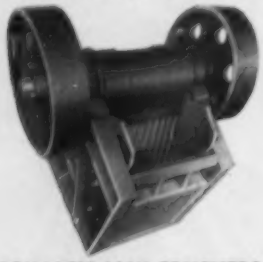

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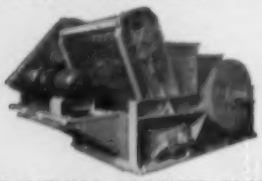

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ROTARY KILN CAPACITY

(Continued from page 174)

conditions favor the coating, it becomes sort of a "casing" around a white center. This color possibly could be driven to the interior of the lime and no white would be left. However, this would result from more iron than is found in most coal ashes.

Examination was made by carefully removing the outside lumps, to further establish the origin of the lime coating. Analysis of this material was:

SiO_2 — 2.4%
Al_2O_3 — 1.4%
Fe_2O_3 — 3.0%
CaO — 79.6%
MgO — 0.8%
Loss — 12.5%

Due to the difficulty of removing this coating, some of the interior of the lime shows in the analysis, and the loss can be accounted for in handling of the sample. The normal product would show an Fe_2O_3 content of 0.25 percent or less.

The degree of burning should be considered when the coal ash characteristics are favorable. Even hard burning will produce a light colored lime when coal with a high A.S.T. and low Fe_2O_3 content is used. For medium coal ash characteristics, light colored lime may be produced with success by careful burning, even using less favorable coals. The quality of the burning assumes considerable importance.

Lime can be burned to such a point that a fresh lump will lie inactive in cool water for hours. It may be hard, and may produce a metallic ring when tossed against a steel plate. This quality may be satisfactory for certain uses.

At the other end of the burning scale, lime may be so active that cold pieces tossed into cold water will practically explode on slaking. This would represent a very high reactivity, and also may be desirable for some uses. An undesirable feature of such a fast-slaking lime would be inferior storage properties.

Lime may be burned to a reactive condition by careful attention to the operating variables of the rotary kiln.

In an actual operation, attention to the burning phase resulted in production of reactive lime of improved color with lower fuel consumption. Where dark lime was made, a heat consumption in excess of 8,000,000 B.t.u. per ton of lime was reduced to the 7,000,000-B.t.u. range, and lower at times. A lighter colored lime resulted. Careful attention toward improvement of quality thus also resulted in improved efficiency of the operation.

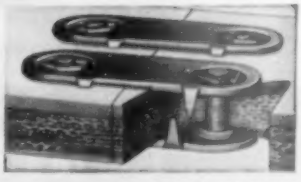
(Continued on page 180)

FLEXCO®

BELT FASTENERS and RIP PLATES

FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.
★ Trough naturally, operate smoothly through take-up pulleys.
★ Distribute pull or tension uniformly.
★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.
★ FLEXCO Rip Plates are for bridging soft spots and FLEXCO Fasteners for patching or joining clean straight rips.



Compression Grip distributes strain over whole plate area

Order From Your Supply House. Ask for Bulletin F-112

FLEXIBLE STEEL LACING CO., 4684 Lexington St., Chicago 44, Ill.

Enter 1631 on Reader Card

Enter 1632 on Reader Card

IT'S Allis-Chalmers ENGINES for *any* Power Need

any FUEL

DIESEL . . . GASOLINE
LP GAS . . . NATURAL GAS

any SIZE

9 TO 616 HP

any TYPE

OPEN OR ENCLOSED POWER UNITS

GENERATOR SETS

FAN-TO-FLYWHEEL ENGINES

MARINE ENGINES

any USE

Make your Allis-Chalmers Engine Dealer your main source of power for all your engine needs. He can supply a wide range of engines for any fuel — gasoline, diesel, LP gas, natural gas — for any use . . . stationary or mobile-power units, fan-to-flywheel engines, generating sets or marine engines. Each has the high-efficiency, long-life characteristics necessary for continuous as well as stand-by service. With a high degree of interchangeability of parts, you can use a different type of engine for each application and yet maintain a small stock of parts.

Write for bulletins or see your Allis-Chalmers Engine Dealer for more information.

ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS A-C

BE 4

AUTOCAR

the BIG name in BIG trucks for HEAVY Hauling jobs

. . . Like this husky Autocar owned by Calcrete Light Weight Block Company of Bakersfield, Calif. with two-trailer units designed for coming-and-going loads of different types of building materials.

GET THE FACTS ABOUT *New Lightweight* AUTOCARS

AUTOCAR has pioneered in weightsaving and payload-building design. Get all the facts today about the new line of lightweight models for extra heavy hauling.

AUTOCAR DIVISION
The White Motor Company
Exton, Pa.

Send me facts about the NEW AUTOCAR Lightweight Models.

Name_____

Firm_____

Address_____

City_____ Zone____ State_____

28-K

AUTOCAR has won a lot of friends—coast to coast—for one reason alone: they get *more* work done!

The big swing is to AUTOCAR—quality-engineered to exact working conditions for maximum efficiency and economy in businesses just like yours.

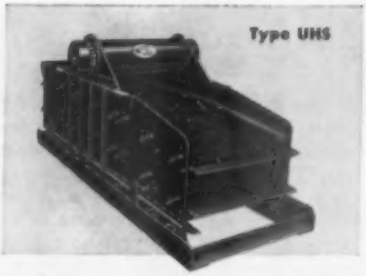
AUTOCAR TRUCKS

DIVISION OF THE WHITE MOTOR COMPANY

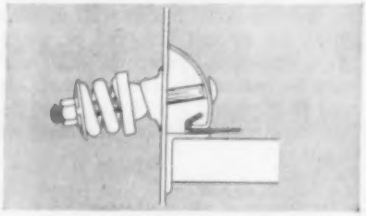
Factory: Exton, Pa.

Export Division • Cleveland 1, Ohio, U. S. A. • Cables: Whitco

Enter 1602 on Reader Card

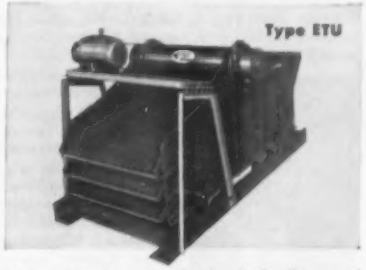


Side tension screen featuring adjustable slope panels. Divided screening sections, identical in size, permit shifting to distribute wear. 1, 2 or 3 decks in sizes up to 6' x 16'.

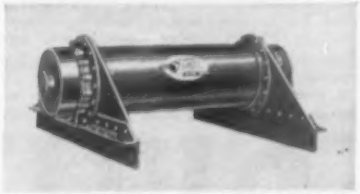


POSITIVE SCREEN CLOTH TENSIONING

Powerful tension springs hold screen cloth (either with hook strips of clamping angles) in tension over series of cross members arranged in arc. Positive tension, plus curvature, prevents whipping.

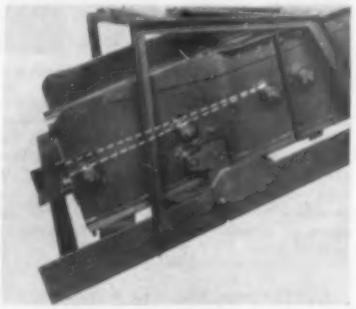


End tension, featuring the longitudinally curved screen surface in combination with the opposed elliptical throw of the Unitized Lifetime Vibrating Mechanism, available in 1 to 4 decks, from 2½' x 4' to 5' x 10'.



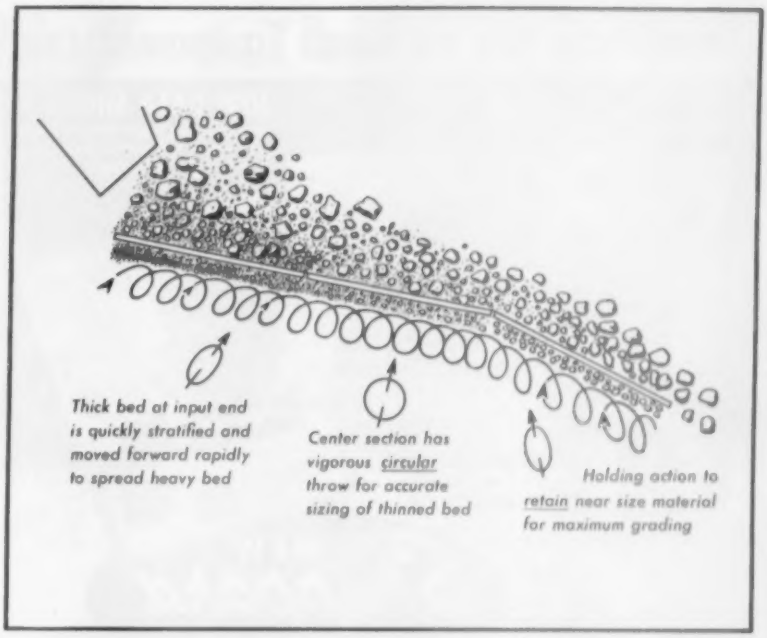
UNITIZED LIFE-TIME VIBRATING MECHANISM

Entire mechanism is precision-constructed, jig-assembled unit—demountable and readily interchangeable—and mounted well above heat, grit and dirt. Renewable sleeves prevent wear on bearing housings and shafts. Oil-bath operation.



EXCLUSIVE ADJUSTABLE SLOPE PANELS

Panels at both feed and discharge ends may be adjusted independently to increase or decrease screening angle.


Thick bed at input end is quickly stratified and moved forward rapidly to spread heavy bed
Center section has vigorous circular throw for accurate sizing of thinned bed
Holding action to retain near size material for maximum grading

OPPOSED ELLIPTICAL THROW

Deister's exclusive powerful throw action provides more capacity per square foot. Movement of material on the screen is controlled accurately, for the greatest speed and efficiency in sizing.

You can depend on DEISTER for

Higher Tonnage ... Lower Costs

Downtime, high maintenance costs, bearing troubles, supporting structure vibration, whipping and excessive cloth wear . . . do *these* have you shaken up more than the materials you screen?

There's really no need for it . . . these problems won't exist for *you* when you depend upon Deister Screens for high efficiency and low cost screening. You'll appreciate Deister dependability . . . hour after hour and day after day without downtime . . . meeting toughest specifications and keenest competition effectively—with highest profit.

Remember, Deister's exclusive Opposed Elliptical Throw, Unitized Life-Time Vibrating Mechanism, and Adjustable Screen Panels at feed and discharge end, were designed and developed by Deister sizing and separating experts . . . men who specialize in giving the industry exactly what it wants and needs.

There are Deister models and sizes to meet every screening requirement. Write Deister today for their data sheet . . . with complete information on your particular screening problem, Deister engineers can recommend a screen to handle your job better.

DEISTER MACHINE COMPANY

1933 East Wayne Street, Fort Wayne 4, Ind.

Enter 1642 on Reader Card

Diesel Pays Big on Small Equipment, too!

Replace Gasoline Engines in Heavy-Duty Service

SAVE 4 WAYS ON POWER COSTS

1. Stop frequent engine replacement
2. Save downtime caused by ignition and carburetor failures
3. Stop on-the-job fuel pilferage
4. Save up to 75% on fuel costs

TAKE LESS SPACE THAN "GAS" ENGINES

3 NEW Sheppard DIESELS

MAIL COUPON TODAY

SHEPPARD DIESELS · HANOVER 31, PA.

Send me data sheets on Sheppard 20 H.P. Model 17A ☐
42 H.P. Model 19 ☐ 78 H.P. Model 16 ☐
Generating Set Size ____ K.W.
Name
Company
Address
City ____ State

- Simplified Sheppard fuel injection
- Spray cooled pistons
- Replaceable wet-type liners
- Standard SAE Flywheel Housings
- 22 to 1 Compression Ratio

Available as optional equipment on most new machines . . . see your distributor for replacement power.

Enter 1552 on Reader Card

STEEL

Every Kind

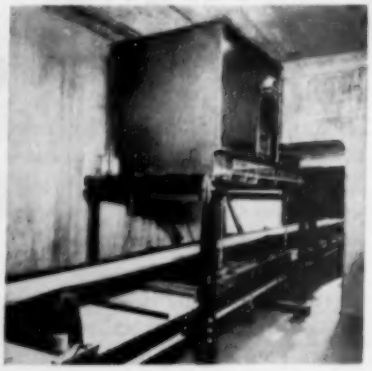
Quick Delivery

Plates, Structurals, Bars, Sheets, Tubes, etc. Carbon, Alloy, Stainless Steels, Babbitt Metal.

RYERSON

Joseph T. Ryerson & Son, Inc. Plants at New York • Boston • Wallingford, Conn. Philadelphia • Charlotte, N.C. • Cincinnati Cleveland • Detroit • Pittsburgh • Buffalo Chicago • Milwaukee • St. Louis • Los Angeles • San Francisco • Spokane Seattle.

Enter 1553 on Reader Card



In plants handling Cement, Lime, Gypsum, Sand, Gravel, Crushed Stone, etc. the WEIGHTOMETER is used for fast accurate production.

WEIGHTOMETER gives a continuous, automatic, and accurate weight record of materials in transit at an extremely low operating cost. All producers of bulk materials handled by belt conveyors need this dependable check on production figures supplied by MERRICK WEIGHTOMETER.

Merrick Scale Mfg. Co.
Passaic, New Jersey

Enter 1554 on Reader Card

KILN CAPACITY

(Continued from page 176)

One of the principal hindrances to rotary lime kiln operation is the formation of scale rings or heavy coating. The kiln gun** has been a great help in alleviating this condition, but the best remedy is still control of the formation. Shells for the gun can become expensive through volume usage. But, compared with intermittent kiln operation, their use may still result in a profitable operation. Costs related to shutting down a kiln will, in most cases, far exceed the cost of shells. As operation is improved, shell cost may be reduced by better techniques, and perhaps end in full control of the kiln operation with a minimum of shells.

**See ROCK PRODUCTS, August, 1955, "Shooting Scale Rings with a Kiln Gun", (p. 81)

MANUFACTURERS NEWS

Chain Belt Co., Milwaukee, Wis., has announced a change in organization structure by grouping several divisions into two sections, namely, an Industrial Equipment Section, made up of the roller chain division, Springfield and Worcester, Mass.; chain and transmission division, Milwaukee; conveyor and process equipment division, Milwaukee; and Shafer bearing division, Downers Grove, Ill.; and a Construction Machinery Section, consisting of the construction machinery division, Milwaukee; California division, Los Angeles; and Chain Belt (Canada), Toronto. The following appointments have been made: W. J. Sparling, vice-president of manufacturing and industrial equipment; O. W. Carpenter, vice-president—construction machinery and finance; E. M. Rhodes, manager of chain operations; J. D. Sloan, manager of roller chain division; A. K. Thomas, assistant to the vice-president of the construction machinery section; W. C. Messinger, manager of the construction machinery division; and J. W. Lendved, director of engineering for the construction machinery division, who will also serve as director of product development for that division.

O. W. Carpenter

W. J. Sparling

E. M. Rhodes

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces that Western Railroad Supply Co., Chicago, Ill., has purchased the railroad supply business of the Buda division of the company.

(Continued on page 182)

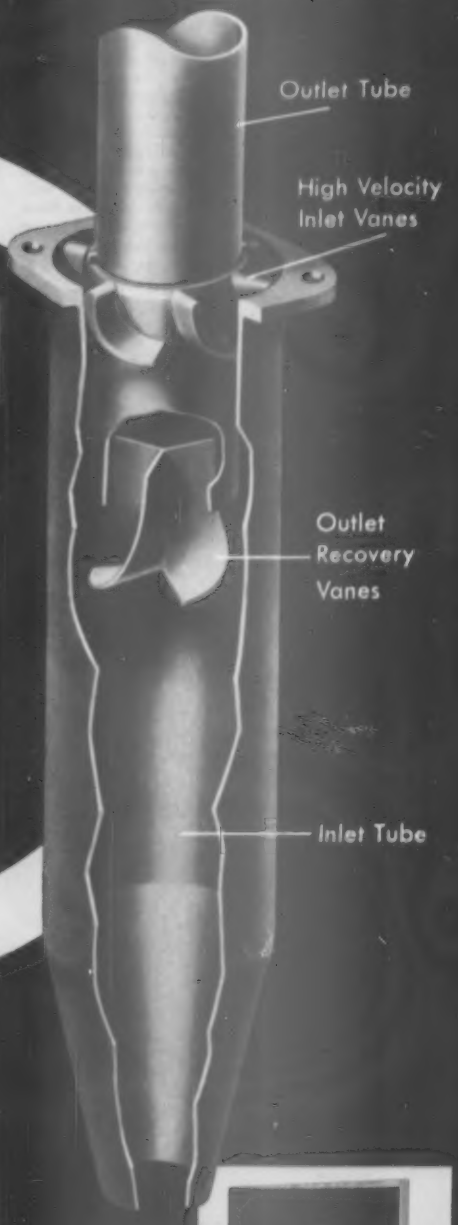
Enter 1555 on Reader Card

NEW Cyclo-trell

multiple tube dust collector

Here are a few brief facts on Research's new multiple tube mechanical collector.

- Collection efficiencies are higher, for a given pressure drop, than other conventional multiple tube collectors.
- Gas flow per tube is higher than conventional units. This means fewer tubes per collector and lower total cost for a given capacity.
- Cyclo-trell's design is based on Research's 45 years experience in manufacturing gas cleaning equipment. As the largest manufacturer of electrical precipitators in the world, Research-Cottrell has engineered and built many combination units consisting of precipitators and mechanical collectors.



Higher Collection Efficiency

An important reason for Cyclo-trell's higher collection efficiency is the aerodynamically shaped inlet vane unit. The purpose of these vanes is to produce a fast spiral of incoming gas. The faster these gases spin, the greater the centrifugal force on the suspended dust.

After testing many types and curvatures of vanes, Research found that this new design resulted in less turbulence, greater centrifugal force and higher collection efficiencies.

Greater Gas Handling Capacity

To develop a higher gas flow capacity than other multiple tube collectors, Research's engineers developed the following design features. First, by using a 10" diameter inlet tube, instead of the conventional 9" tube, the flow of incoming gas was increased.

The next step was to straighten the gas flow as it entered the outlet tube, since a spiraling gas stream creates more resistance than a straight through flow. In the Cyclo-trell this spiral is eliminated, and energy is recovered, in the outlet tube by the Outlet Recovery Vanes. By positioning these vanes below the tube, rather than inside, resistance has been further reduced.

This combination of features means greater gas flow per tube, fewer tubes per collector and a lower total cost for a given capacity and efficiency.

Bulletin M gives complete details on design features, efficiency, capacity and detailed dimensional drawings. Write for your copy today.

Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, N. J. • 405 Lexington Ave., New York 17, N. Y. • Grant Bldg., Pittsburgh 19, Pa. • 228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

which includes the complete line of jacks (ball bearing screw, journal, hydraulic, ratchet and rail bender), car and locomotive replacers, track liners, bumping posts, car stops, rail and bonding drills and the universal diesel nozzle testers.

Iowa Mfg. Co., Cedar Rapids, Iowa, announces the appointment of **Fred Dolton** as district sales representative for Cedarapids aggregate producing and bituminous mixing equipment in New England states and metropolitan New York. He was formerly project engineer in sales development for Hewitt-Robins, Inc.

Hyster Co., Portland, Ore., announces that Jack A. Cairns has been promoted to supervisor of advertising and promotion for the industrial truck division. He was formerly sales representative in the Los Angeles area. Duane A. Kragrud has been appointed eastern division parts and service manager, with headquarters at Danville, Ill. He has served as a resident engineer in the general parts and service department at Portland since 1951. Richard M. Ervin has been named manager of the Washington, D. C., office and district manager of the east-central industrial division, succeeding Robert E. Lange, who becomes resident manager of the subsidiary plant to be opened in Sao Paulo, Brazil. Robert A. Fletcher and L. Kenneth Bliss have been named district representatives in the eastern division tractor equipment sales department.

Jack A. Cairns

R. G. LeTourneau, Inc., Longview, Texas, has announced the appointment of Stan Fain as advertising supervisor. He was formerly assistant advertising manager for American Air Filter Co., Inc., Louisville, Ky.

Westinghouse Air Brake Co., New York, N.Y., announces the election of A. King McCord as president and chief executive officer. He succeeds E. O. Boshell, who has been serving as both chairman of the board and president since 1951. Mr. McCord formerly was president of the Oliver Corp., manufacturers of agricultural and construction equipment, where he started as an attorney in 1930 and served successively as assistant secretary and general counsel, vice-president and director, first vice-president and executive vice-president.

A. King McCord

The Bristol Co., Waterbury, Conn., has opened a new sales office in Denver, Colo. R. G. Tower, who has been with the company since 1922 and at present is manager of the Chicago office, will be manager of the new district office.

The Al J. Goodman & Sons Co., Asheville, N. C., announces the death on June 28 of Al J. Goodman, founder of the company, which will be continued by his three sons, B. Paul, Arnold S. and Al J. Goodman, Jr.

The Heltzel Steel Form & Iron Co., Warren, Ohio, has named William J. Kirchner as chief engineer to succeed Fred Mittelstadt who has retired. Mr. Kirchner has been with the company for the past seven years, serving as design engineer, field engineer, and supervising engineer of the fin design section.

The Howe Scale Co., Rutland, Vt., announces the appointment of A. R. Haskins as manager of the Chicago branch with W. J. Jensen of Rutland as service manager. Mr. Haskins was formerly manager of the Cleveland branch and will be succeeded by Robert N. Elliott who has been associated with the Cleveland office for the past several years. Russell A. Anderson was recently appointed manager of the Minneapolis office.

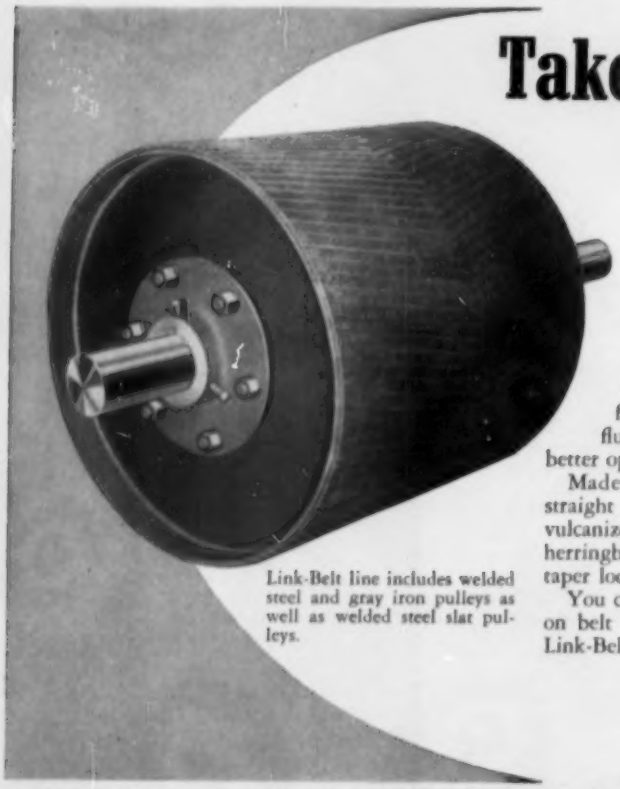
Hercules Powder Co., Wilmington, Del., has announced the retirement of LeRoy Keane, assistant general manager of the explosives department, after 38 years of service. He joined the explosives sales staff of the Pittsburgh district in 1918, was named assistant manager of the sales office in 1932, and four years later became manager of the office. He was transferred to Wilmington as director of sales in 1945 and became assistant general manager in 1953.

Dodge Mfg. Corp., Mishawaka, Ind., has announced the following appointments: Carl W. Petersen, executive vice-president; Earl Wedlake, vice-president in charge of production and purchasing; Karl D. Jahnke, secretary-treasurer to succeed Temple Williams who has retired; Lloyd F. Lamm, president of Chicago Thrift-Etching Corp., subsidiary, of which he has been vice-president and general manager since 1944; and Carlton Shamo, supervisor of publicity.

The Electric Storage Battery Co., Philadelphia, Penn., has appointed George L. Nicholls as branch manager at Seattle, Wash. He succeeds the late F. G. H. Manring, who died April 3. Mr. Nicholls has been resident representative in Portland, Ore., since 1949.

H. K. Porter Co., Inc., New York, N.Y., announces that Lawrence L. Garber has been named vice-president in charge of production.

(Continued on page 186)



Takes the work out of field mounting

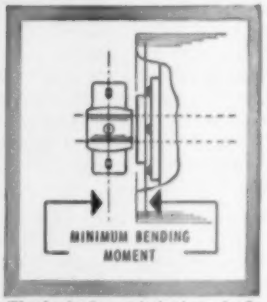
LINK-BELT assembles pulley on shaft—insures correct keyseat alignment

Link-Belt line includes welded steel and gray iron pulleys as well as welded steel slat pulleys.

YES, you get a two-way dividend because Link-Belt mounts belt conveyor pulleys on their shafts at the factory. What's more, the flush-hub construction means better operation.

Made with either crowned or straight face, they are available with vulcanized lagging, either plain or herringbone. Your choice of bolted or taper lock hubs.

You can get complete information on belt conveyor pulleys from your Link-Belt salesman. Call him today.



Flush hubs minimize shaft deflection, cut hub bolt stress and disc deflection.

LINK-BELT

WELDED STEEL CONVEYOR PULLEYS

93.C6-A

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

Enter 1556 on Reader Card

IN QUARRY OPERATIONS... equipment-hours saved are the same as cash!

ALEMITE

"ON-THE-JOB" LUBRICATION

1. Boosts Production! By cutting expensive downtime for lubrication—increasing output of both men and equipment!

2. Saves Money! By giving bearings top protection from dirt, dust and grit—guarding against costly breakdown!

3. Saves Time! By bringing clean, fresh lubricant right to the machines—where you need it, when you need it!

• Here the sheaves of a shovel get a shot of clean, new lubricant. Operator is using Alemite Hand Gun 6243-J. This lever-type gun has plenty of power to push out old grease and dirt—capacity to serve many bearings without refilling!

Heavy-Duty Hand Gun for Toughest Lube Jobs!

Handles all pressure gun greases. Spring-primed for positive delivery. Follower rod disappears after filling. Pressure up to 10,000 lbs., lubricant capacity 24 oz. Model 6243-J.

• Alemite Loader Pump 7181-L fills a hand gun quickly—easily. Just eight strokes of the pump fill the gun completely. No mess, no waste, no troublesome air pockets. Lubricant is protected at all times from destructive dirt, dust and grit.

Loader Pump Saves Time in Refilling Hand Guns!

Clean, fast, mechanical loading of all hand guns equipped with standard Alemite Loader Fittings. Sizes to fit original refinery-filled 120- and 400-lb. drums, or 25- and 35-lb. buckets. Model 7181-L.

• The track support rollers of this power shovel are getting positive lubrication protection from this Alemite 6521-B Tractor Bucket Pump. 35-pound capacity means less time wasted in refilling, and lubricant reaches bearings "refinery clean." Fast—efficient!

Bucket Pump—Built Specially for Construction Work!

Sturdily built to give rugged construction industry service. Handles all regular pressure gun or gear lubricants. Develops 3,000 psi pressure. Delivers 1 lb. in 17 strokes. Tank holds 35 lbs. Model 6521-B.

ALEMITE, Dept. EE-106
1850 Diversey Parkway,
Chicago 14, Ill.

Gentlemen: Please send me your FREE illustrated booklet showing Alemite "On-the-Job" equipment and containing complete information on Alemite lubrication methods.

Name _____

Company _____

City _____ Zone _____ State _____

ALEMITE

REG. U. S. PAT. OFF.

Products of **STEWART-WARNER CORPORATION**

STEWART SW WARNER

...because they went to their doctors in time

Many thousands of Americans are being cured of cancer every year. More and more people are going to their doctors *in time*. That is encouraging!

But the tragic fact, our doctors tell us, is that every third cancer death is a needless death... *twice* as many could be saved.

A great many cancers can be cured, but only if properly treated before they have begun to spread or "colonize" in other parts of the body.

YOUR BEST CANCER INSURANCE is (1) to see your doctor *every year* for a thorough checkup, no matter how *well* you may feel (2) to see your doctor *immediately* at the first sign of any one of the 7 danger signals that may mean cancer.

For a list of those life-saving warning signals and other facts of *life* about cancer, call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society

This is a complete Universal-engineered plant operating in the Limestone quarry of McDonnough Brothers, Inc. near San Antonio, Texas. Of the Universal plant, Mr. McDonnough said, "We consider it the best engineered plant available".

"600 tons per hour 100% passing 1½" screen with our Universal 4650 Impact Master"

Says Mr. James P. McDonnough, president, McDonnough Brothers, Inc., San Antonio, Texas

The Universal 4650 Impact Master. In-fed rock is reduced by a smashing blow from two rotor hammers turning in the same direction. Material moves forward and out by straight-line action.

"WE PURCHASED a complete Universal plant, including the 4650 Universal Impact Master for our limestone crush because we consider it the best engineered plant available. And we consider the Universal Impact Master the best operating crusher.

"We have, so far, produced 600 tons per hour of 100% crush passing 1½" screen with our Universal 4650 Impact Master. We have not yet come close to the capacity limits of our new plant, but are confident that we are equipped to crush at least 800 tons per hour.

"In 1951 we purchased a Universal Impact Master (Model 3042) for crushings mainly in 7/16" size, for limestone used in asphalt and chemicals. Continuous operation of this plant for six years has given us an excellent opinion of the worth of Universal equipment and was a determining factor in our purchase of a complete new Universal-engineered plant this year."

Aggregate producers everywhere look to the Universal Impact Master for top production in all types of material. It gives them more uniform gradation . . . top quality cubical aggregate with minimum wear and maintenance. Universal equipment is engineered for the rock crushing industry by men who know rock crushing equipment.

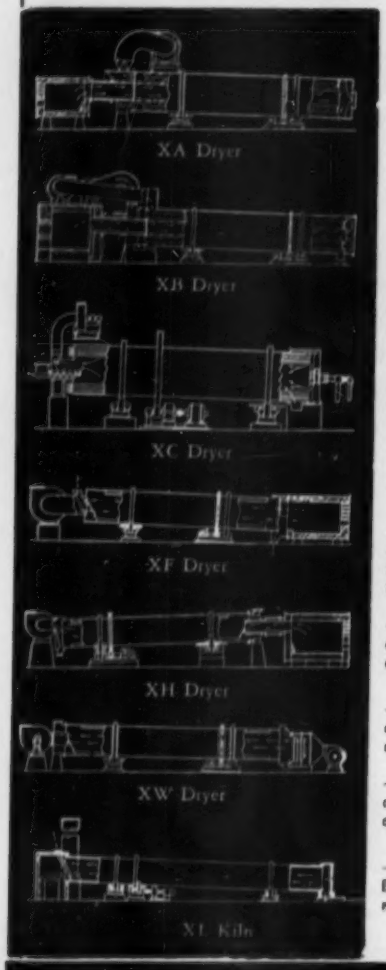
Write for complete information on the Universal Impact Master today.

PETTIBONE UNIVERSAL
In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
617 C Avenue, N.W., Cedar Rapids, Iowa
A subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Enter 1659 on Reader Card

Ruggles-Coles



DRYERS, KILNS, COOLERS

Ruggles-Coles Rotary Dryers, built by Hardinge, are available in the following styles:

CLASS XA
— Double shell, semi-direct heat. High efficiency. For materials that can be dried in direct contact with combustion gases and heated above 212°.

CLASS XB
— For materials that must be dried by indirect heat but can be heated above 212°. A double shell dryer with low dust loss.

CLASS XC
— Steam tube dryer for materials that must be dried by indirect heat and at low temperatures, such as chemicals, grains, food products.

CLASS XF
— For direct heat drying at temperatures above 212°. A single shell, counter-flow dryer that does not discharge the material through the furnace.

CLASS XH
— For direct heat drying at temperatures above 212°. A single shell, parallel flow dryer designed to handle sticky materials.

CLASS XW
— For material that can be dried by hot air at temperatures below 212°. Dries ammonium nitrate; potassium chloride, etc.

KILNS
— Rotary type for drying, calcining, roasting or oxidizing at temperatures above the range of ordinary dryers. Refractory lined.

COOLERS
— Air, water-spray, or submerged rotary types. Each designed for the efficient cooling of materials from kilns or roasters.

Bulletin 16-D-7 describes entire Ruggles-Coles line.

HARDINGE
COMPANY, INCORPORATED

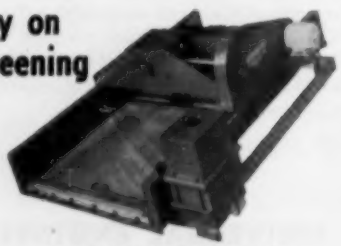
YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works

New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco

Enter 1663 on Reader Card

For Highest Efficiency on Difficult Fine Mesh Screening

The new Model E Leahy® Heated Screen has been designed for the most efficient screening of damp fines such as lime, ag-lime or silica sand. It is a completely new integrated unit with built-in heating and differential vibration, all coordinated for low cost production on back-breaking schedules. Send for Bulletin 16-EH.



Made by the Original Deister Co.
Incorporated 1906

The DEISTER CONCENTRATOR COMPANY, INC.
915 Glasgow Avenue, Fort Wayne, Indiana

Enter 1664 on Reader Card

and Eugene Salinger has been appointed general manager of the Henry Disston division, Philadelphia, succeeding Mr. Garber. Charles L. Swinden and Willard J. Hannon have been made sales representatives for the Leschen wire rope division. Mr. Swinden will cover California from Sacramento on the north to Tulare on the south and from the East Bay area through most of Nevada. Mr. Hannon's territory includes western Illinois, St. Louis and most of Missouri.

Pioneer Engineering Works, Inc., Minneapolis, Minn., has elected W. A. Rundquist as vice-president of sales promotion, and A. J. Belanger as vice-president of sales, according to an

W. A. Rundquist

A. J. Belanger

announcement by O. J. Ellertson, president. Mr. Rundquist, who is also director of advertising and public relations for Poor & Co., parent company, has been in charge of advertising and sales promotion since 1945. He was graduated from North Dakota State College with a degree in mechanical engineering. Mr. Belanger joined Pioneer in 1940, was appointed assistant sales manager in 1951 and sales manager in 1953. He received his master's degree in engineering from the University of Minnesota.

International Paper Co., Bagpak Division, New York, N. Y., has announced the sudden death on July 23 of Frank N. Gladden at his home in Los Angeles, Calif. Mr. Gladden, who joined the company in 1932 with the southern kraft division, joined the bagpak division in 1946 and had represented the division in Los Angeles since that time.

Bemis Bro. Bag Co., St. Louis, Mo., announces that A. N. Weeks has been appointed director of production to succeed A. H. Clarke who will retire on January 30, 1957. Mr. Weeks was formerly manager of the multiwall paper bag plant at East Pepperell, Mass., and will be succeeded by F. G. Bemis, Jr. Mr. Clarke will continue as a vice-president and director until his retirement.

Fuller Co., Catasauqua, Penn., has acquired all assets of Lehigh Fan & Blower Co., Allentown, Penn., which will continue as the Lehigh Fan & Blower Division of Fuller Co.

Dorr-Oliver, Inc., Stamford, Conn., announces the promotion of Albert L. Morris from director of public relations to director of company relations, succeeding Wm. Harold Oliver, who has retired as vice-president for public relations and personnel after 46 years of service.

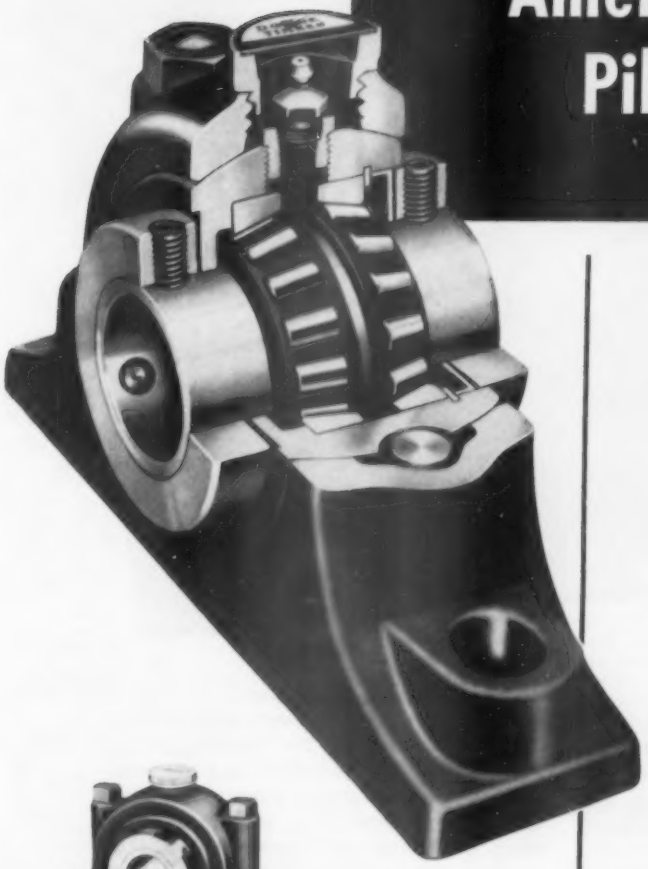
Western Machinery Co., San Francisco, Calif., announces the appointment of Gilman Y. Murray as head of sales activities for the western district of Western-Knapp Engineering, also the engineering, design and construction division of Western Machinery Co. He was formerly research, application and field engineer with the processing machinery division of Allis-Chalmers Mfg. Co.

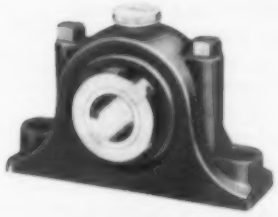
Stulz-Sickles Co., Newark, N. J., has announced the death on July 13 of L. A. Davis, vice-president and district sales manager. He was 56 years old and had been associated with the company since 1945.

(Continued on page 189)

AVAILABLE IN FIVE TYPES
FOR ALL KINDS OF SERVICE

DODGE-TIMKEN
America's Quality Pillow Block





● COMPLETELY ASSEMBLED
● FACTORY ADJUSTED
● PRE-LUBRICATED

DODGE-TIMKEN Bearings are adjusted, lubricated and sealed at the factory. Labrynth seals effectively retain the lubricant and prevent the entrance of dust and dirt. The inbuilt precision of Dodge-Timken Bearings is protected both on and off the shaft. They are delivered fully assembled, ready to mount.

Where service conditions are toughest Dodge-Timken Bearings prove their quality decisively. For superior performance, dependability and long life they have won their reputation throughout industry as America's quality pillow blocks.

To meet varying service requirements Dodge-Timken Pillow Blocks are available in five types—the type E . . Double Interlock (illustrated) . . Type C . . Special Duty . . . and All-Steel. Available in a range of shaft sizes from 1-3/16" to 10".

Call your Transmissioneer; or write for Bulletin A638 giving load ratings, dimensions and other data on Dodge-Timken Roller Bearings.

DODGE MANUFACTURING CORPORATION
2600 Union Street, Mishawaka, Indiana

Call the Transmissioneer, your local Dodge Distributor. Factory-trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

DODGE
of Mishawaka, Ind.

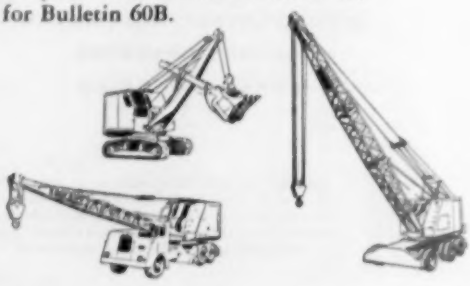
Enter 1658 on Reader Card

MORE POWER ~~TO~~ for YOU!

How the EXTRA POWER in the NEW BAY CITY ONE YARD SHOVEL HELPS YOU

260

The *greater power* and greater strength built into the new heavy-duty BAY CITY one yard-shovel results in smoother, faster operation for you. There's *greater power in the engine:* a big 113 H.P. Diesel assures you of the ability to get in and out of tough places, to dig hard materials with ease, and to maintain a fast, smooth digging cycle. *Power steering* through cone clutches which actuate brakes, gives you superior maneuverability: you can make sharp or gradual turns in either direction while the machine is in full motion . . . you don't have to stop to throw out jaw clutches or set steering brakes. *Power Boom Hoist* on the BAY CITY raises and lowers boom always under power, and the *Power Dipper Trip* makes dumping much easier and much faster. In addition, the BAY CITY has *Power Booster Clutches* which take fatigue out of operating and give you bigger yardage. Put this powerful BAY CITY to work. Get further information today, from your local dealer or write the factory for Bulletin 60B.



BAY CITY SHOVELS INC. • BAY CITY, MICHIGAN

BAY CITY

SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

Enter 1656 on Reader Card

R. A. Fryer

D. W. Sheehan

The White Motor Co., Cleveland, Ohio, announces that Roy A. Fryer, formerly assistant sales promotion and advertising manager, has been promoted to advertising manager, and David W. Sheehan, who has been serving as assistant to the vice-president of sales, has been appointed sales promotion manager. Mr. Fryer has been associated with the company since 1943, and Mr. Sheehan has been on the national sales staff for the past two years.

The Oliver Corp., Chicago, Ill., announces that Alva W. Phelps, chairman of the board, has also been elected president of the company, and Carl L. Hecker, first vice-president since 1952, has been named executive vice-president.

Raybestos-Manhattan, Inc., Passaic, N. J., has announced the appointment of H. H. Burrows as senior vice-president of the rubber sales division, and R. B. Hazard as vice-president and sales manager of rubber and packings. S. J. Synnott has been named assistant sales manager of rubber products, and C. V. Vetell, manager of rubber product sales.

The Wellman Engineering Co., Cleveland, Ohio, announces that John J. McGlone has been elected vice-president of the Williams Bucket Division, in addition to his duties as general manager of the division.

The Mine & Smelter Supply Co., Denver, Colo., has announced the death on July 30 of C. G. Willard, a recognized authority in the ore-grinding field. He was 70 years old. Mr. Willard joined the company in 1918 as assistant manager of the Marcy mill division, later becoming manager of the division, a director of the Mine & Smelter Supply Co., executive vice-president and director of Colorado Iron Works Co., division of the company, and a vice-president of General Iron Works Co., manufacturing division.

Air Reduction Sales Co., New York, N.Y., has released a 20-min. sound slide film entitled "Always on the Job," covering basic principles of safety in electric arc welding. This is a companion film to the oxy-acetylene safety slide film "The Guy Behind Your Back."

Heltzel Steel Form & Iron Co., Warren, Ohio, has announced the appointment of Kenneth Simpson as district representative for the Heltzel company and The Flexible Road Joint Machine Co. in eleven western states, with headquarters in Redondo Beach, Calif. He was formerly with The Noble Co. and Standard Steel Co.

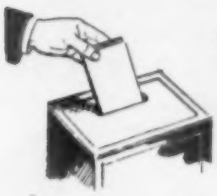
Greer Hydraulics, Inc., Jamaica, N.Y., announces the appointment of James W. Rigley as sales engineer in the northern New Jersey and New York state territories of the products division.

Baker-Raulang Co., Cleveland, Ohio, has announced the appointment of John A. Matousek as assistant to the president. He joined the company in 1950 as plant manager.

Coles Cranes, Inc., Joliet, Ill., has announced the appointment of Herbert P. Strack, Jr., as east coast regional manager. Mr. Strack has been in the materials handling field in Baltimore, Md., for the past seven years.

In the rock products field . . .

Stone Mountain casts its ballot for



Pangborn Dust Control

. . . and votes itself $13,000 a year!

Stone Mountain Grit Co., Lithonia, Ga.—world's largest manufacturer of diversified granite products—had to control dangerous, abrasive granite dust resulting from its operations.

Stone Mountain chose two Pangborn Dust Collectors to solve its problem. Through efficient control of dust, these Pangborn installations have improved employee efficiency, cut housekeeping costs and greatly reduced repair cost on machinery. In addition, granite dust salvaged by Pangborn totals five tons a day and is sold for a profit totaling approximately $13,000 a year!

Pangborn CONTROLS DUST

How do you Vote?

If you're interested in efficient, profitable plant operation, cast this "ballot" for additional information on Pangborn Dust Control. Send to Pangborn Corp., 4300 Pangborn Blvd., Hagerstown, Md.

CAST YOUR BALLOT

☐ Please send me more information on Pangborn Dust Control immediately.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

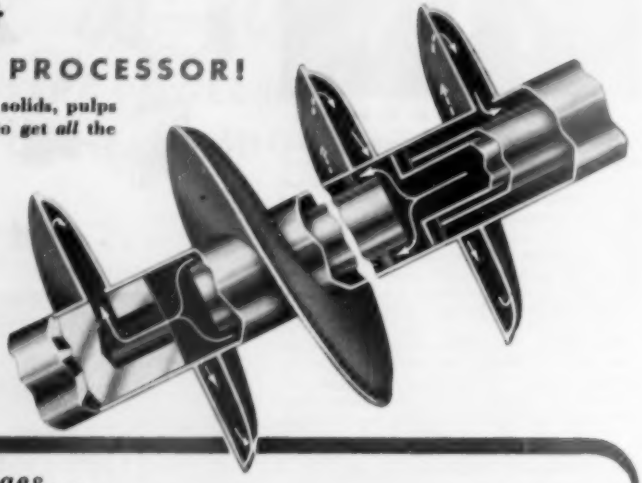
Enter 1599 on Reader Card

if you have a Cooling . . . Heating . . . or Drying problem

investigate the revolutionary advantages of . . .

THE holo-flite* PROCESSOR!

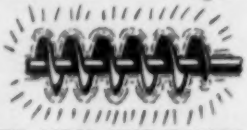
If you have processes where slurries, granular solids, pulps or pastes are cooled, heated or dried, be sure to get *all* the facts on HOLO-FLITE advantages.



HOLO-FLITE handles such processes — *in continuous flow* — in as little as 1/5th the space of other types of heat exchangers. What's more, it is readily adaptable to a wide range of applications — is simple to install and maintain — and provides many other important savings.

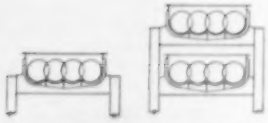
typical HOLO-FLITE *advantages . . .*

ITS APPLICATION FLEXIBILITY is almost unlimited. It cools, heats, or dries. It handles granular solids, pulps, pastes, slurries and fluids with equal ease. Its heat transfer agent can be water, refrigerant, hot oil, Dowtherm, steam or other liquids or vapors at any of a wide range of temperatures. It cools materials in ranges from 1800°F to 0°F. It heats and dries with hot oil to 600°F . . . with Dowtherm to 750°F . . . with steam to 150 lbs. per sq. in. pressure.



THE LARGE HEAT-TRANSFER SURFACE saves space — HOLO-FLITE requires as little as 1/5th the space of other heat-exchange equipment of comparable capacity. Moreover, a more complete heat transfer is effected, resulting in more uniform processing.

ROTATION IS SLOW — granular and powdered solids are handled with practically no dusting — negligible abrasion. There are no dust recovery problems — a further saving in installation, maintenance and operating costs!



ITS OPERATING CAPACITY is readily adaptable to virtually any requirements by simply varying the diameter, pitch, and length of flights, as well as the number of "tiers." Multi-tier units require no more floor space than single-tier installations!

HOW HOLO-FLITE WORKS . . .

Basically the HOLO-FLITE consists of one or more flights of hollow-bladed screw conveyors. The product to be processed moves through a trough housing the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums — *as the product is continuously moved along in a bulk-flow without interruptions!*

GET THE COMPLETE FACTS on Holo-Flite savings and how this field-proven unit can save space, time and money on your processing operations. This eight-page descriptive bulletin will gladly be sent on request. No obligation, of course!

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1006 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
CHRYSLER BLDG., NEW YORK 17 • 1 N. LA SALLE ST. BLDG., CHICAGO 2
OLIVER BLDG., PITTSBURGH 22 • 3252 PEACHTREE RD. N.E., ATLANTA 5
HOBART BUILDING, SAN FRANCISCO 4
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL

* T.M. Reg. (Hollow-Flite)

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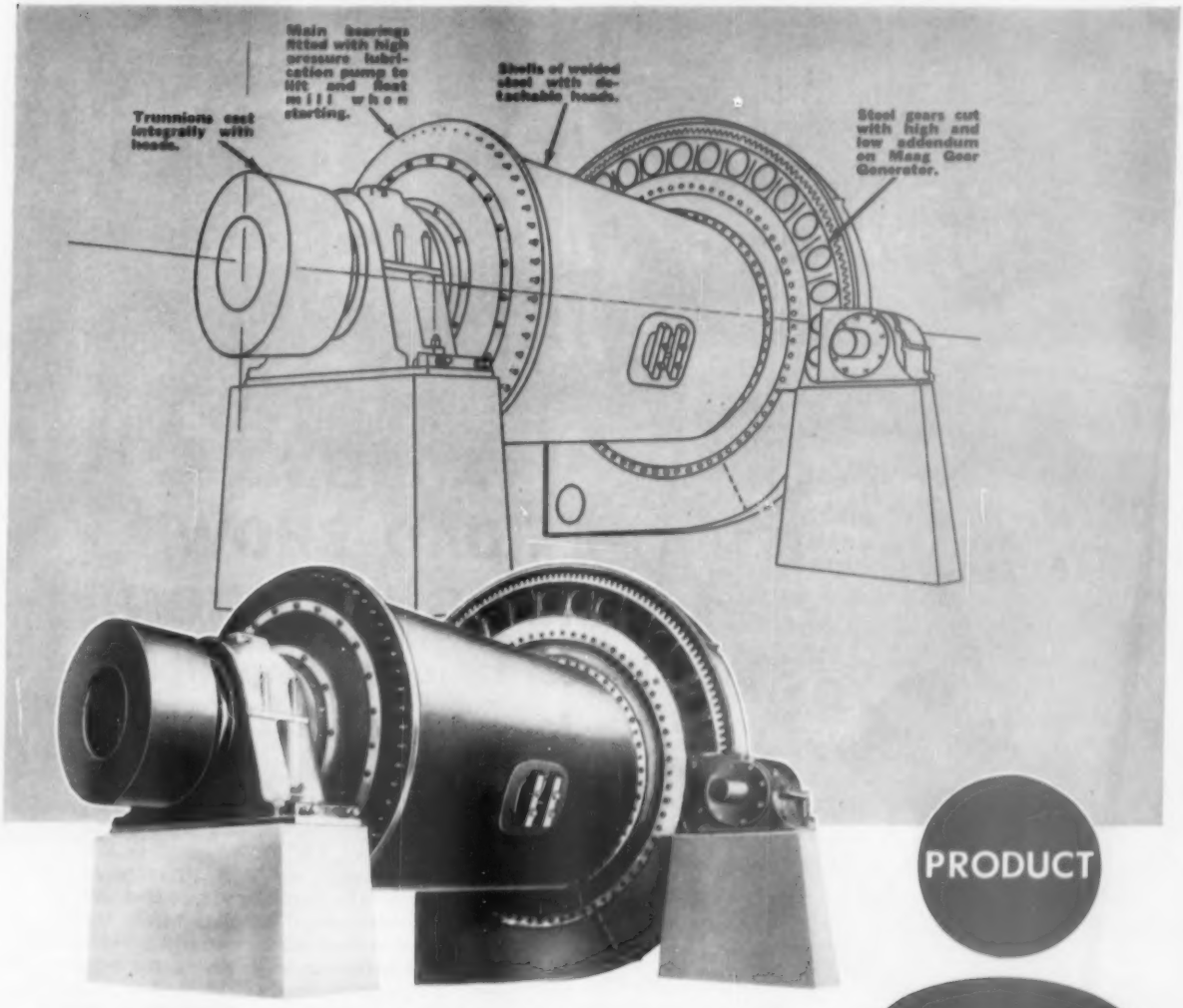
For over a half-century Traylor Grinding Mills have been regarded as the accepted standards of grinding mill design.


Main bearings fitted with high pressure lubrication pump to lift and float mill when starting.
Shells of welded steel with detachable heads.
Trunnions cast integrally with heads.
Steel gears cut with high and low addendum on Maag Gear Generator.

Traylor Grinding Mills Improve All 3

PRODUCT

PRODUCTION

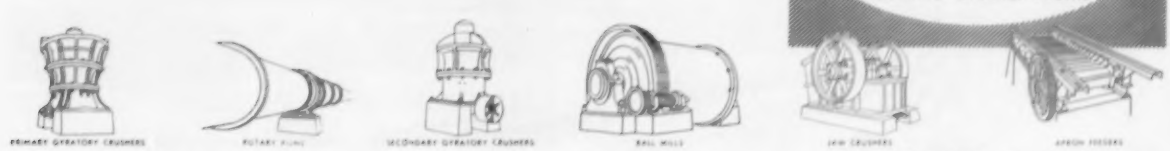
PROFITS

Leading producers rely on the many proven features of Traylor Grinding Mills to assure them more efficient production with added production economies.

Available in sizes to meet practically every requirement. Traylor Grinding Mills are offered in a wide variety of types including: Rod, Compartment, Ball, and Tube Mills for wet or dry . . . coarse or fine grinding.

TRAYLOR ENGINEERING & MFG. CO.
846 MILL STREET, ALLENTOWN, PA.
SALES OFFICES: New York • Chicago • San Francisco
Canadian Mfr.: Canadian Vickers, Ltd., Montreal, P.Q.

A Traylor Leads to Greater Profits



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CHICAGO

the most IMPORTANT PLACE for the Construction Industry in 1957

A.R.B.A. ROAD SHOW and CONVENTION, International Amphitheatre, Jan. 28 to Feb. 2, 1957

Here in Chicago everything is being done to make the coming A.R.B.A. Road Show and Convention an event that will be remembered for its value as an instructive conference, a helpful equipment show and its pleasures. Chicago's vast hotel setup is being organized to care for the large attendance that will be present. The International Amphitheatre is the largest exhibit hall in the Country and will provide an ideal spot for gathering and viewing the over 1,000 pieces of equipment that will be shown.

The Stock Yards Inn with its many eating places and cocktail lounges, and the cafeterias in the Amphitheatre, assure comfortable restaurant facilities.

Free Bus Service from the main hotels will assure adequate transportation and permit attending convention sessions regularly and at the same time allow you to spend time at the show.

Add to all this the many attractions that Chicago always provides.

Remember the place—the date—and make your plans. Ask to be put on the list to receive future information on the 1957 Road Show and Convention.

AMERICAN ROAD BUILDERS' ASSOCIATION

World Center Building Washington 6, D.C.

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA · AMERICAN ROAD BUILDERS' ASSN. 1902

REMOVES OVER 90% OF DUST RESISTS HEAT AND ACIDS!

New collector in operation—over 90% of the dust in stack effluent eliminated.

Proved in use, Southern's new wet type dust collector eliminates 90% of atmospheric dust, while resisting heat and acids.

It all started when we set out to manufacture a light weight aggregate for the building industry. Because of excessive heat, corrosive and abrasive action, we faced a tough atmospheric pollution problem: over 50,000 c.f.m. of reddish brown stack effluent was escaping from six stacks. Many dust collectors—including a commercial wet type—were tried, but none lasted more than a few weeks; none could withstand the heat, acids, and corrosion present. Finally Southern experts solved the problem with an all-new wet type collector that removes approximately 50 tons of dust per day.

If your plant faces a difficult atmospheric pollution problem, it will pay you to get the facts on this new collector. Just contact us. We'll be happy to send a representative, or mail the information desired. No obligation, of course.

SOUTHERN LIGHTWEIGHT AGGREGATE CORPORATION

PROCESS ENGINEERING DIVISION, BOX 9138 RICHMOND, VA.

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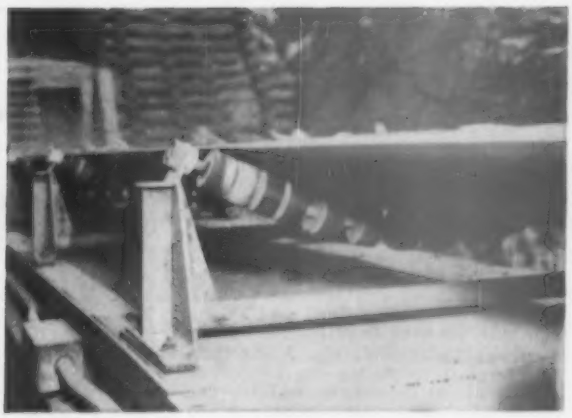

NEW CONVEYOR BELT IDLER

Handles sticky, abrasive, dusty, or corrosive materials.

Has only two bearings—up out of the dirt.

A 2-bearing, cable suspension idler that resists dust, abrasion, corrosion and material buildup is proving itself superior for bulk handling in many industries.

Called the Limberoller, it has already given *10 times* the service life of replaced steel idlers in handling abrasive foundry sands, coal, petroleum coke, potash, copper ores, copper mill tailings, iron ore, wet concrete, triple super phosphate, ammonium sulphate, and sticky fertilizers.

Pressure-molded neoprene or rubber discs on a flexible steel cable conform to load and cushion the belt, help keep belt aligned, and are self-cleaning. The two bearings are up out of the dirt zone; have had no design failures.

Unaffected by most corrosives that damage steel, the new idler is ideal for chemical, sulphur and salt plants; corrosive and high ozone atmospheres. It is more abrasive-resistant than steel and flexes out of the way of abrasive materials.

The Limberoller weighs ⅔ less than a conventional steel idler; is locked by a simple cotter key into special lightweight stands for easy installation and removal. No cover sheets are needed. Two types of stands are available: one that bolts to conventional rigid sections; and a self-supporting type that forms its own easily-erected portable sections without bolts, by using special stiffening rails.

Because of these unique features, many companies have adopted Limberollers as standard for all belt conveyor operations. Details from *Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa. Request Bulletin 30-27.*

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RESISTO-LOY

can prolong life of your Gyratory Mantle Liners Indefinitely

Some genuine economies can be obtained through the application of RESISTO-LOY on these primary crusher mantle liners. There are many instances where mantle liners such as illustrated below, have been crushing for several years on very hard materials without ever having been removed from the mantle.

This notable saving results from regularly replacing the RESISTO-LOY just before the abrasion has reached the manganese liner. When such maintenance is carried out, these liners can be fully expected to operate indefinitely. The first application of RESISTO-LOY represents but a fraction of the cost of a new liner.

This Application of RESISTO-LOY is a job that can easily be done the first time and repeatedly thereafter by your own plant maintenance welder. There are just a few simple instructions which our Field Man will gladly discuss with you. Don't overlook this important economy.

THE RESISTO-LOY CO., INC. Manufacturers Grand Rapids 7, Michigan

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AUTO VORTEX CLASSIFIERS...

MOST EFFICIENT BY ANY MEASURE FOR SINGLE OR MULTIPLE SPLITS!

COMPARE RESULTS . . . COMPARE COSTS . . . AGAINST ANY OTHER SAND GRADATION EQUIPMENT! AFTER SUCH COMPARISON, YOU, TOO, WILL BUY AUTO-VORTEX CLASSIFIERS . . . WHATEVER YOUR SPECIFICATIONS . . . WHATEVER YOUR PROBLEMS!

WRITE FOR OUR BULLETIN No. 81!

PATS. PEND.

CHARLES E. WOOD COMPANY

906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

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HETHERINGTON & BERNER

DREDGING PUMPS

performance-proven on the toughest jobs

H&B ESTABLISHED 1887

Hetherington & Berner sand and gravel pumps are available in two general types: *STANDARD*, (4", 6" and 8" sizes) with semi-steel parts, for ordinary working conditions and moderate heads; and *DREADNAUGHT*, (6", 8", 10", 12" and 15" sizes) with manganese steel parts, for heavy duty jobs with stringent head conditions.

Write for Bulletin DP-147.

HETHERINGTON & BERNER INC.

755 Kentucky Ave. Indianapolis 7, Indiana

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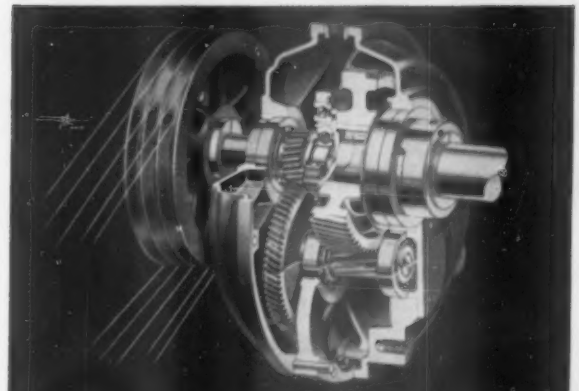


Here's why AMERICAN SHAFT-KING is the pace setter among speed reducers

- **THEY'RE Versatile**—built for use with motors of any make, any type, any age.
- **Easily Installed**—no special shafts or shaft extensions needed. Also come with exclusive tapered hub construction.
- **Made in two ratios**—13:1 and 20:1—for speeds from 5 to 154 R.P.M. and seven sizes from ¼ to 42 H.P.
- **Equal efficiency** on either horizontal or vertical mountings.
- **Precision-Built**—Shaft-Kings are built from components made on equipment chosen solely for this purpose, using techniques unsurpassed anywhere . . . comply with A.G.M.A. standards throughout.
- **Shaft-Mounted**—no special supports or foundations needed; space is saved.
- **Proven Performance**—over 100,000 American Speed-Reduction Drives are in use in every industry, in thousands of companies, large and small, throughout the world.
- **Immediately Available**—from distributor stocks everywhere.

In other words, American Shaft-King gives you

POWER AT THE SPEED YOU NEED

Write today for complete catalog including selection tables.

The American Pulley Company
POWER-TRANSMISSION DIVISION
4212 Wissahickon Ave. • Phila. 29, Pa.

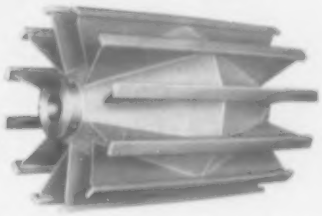
Enter 1667 on Reader Card

FOR GREATER MATERIAL HANDLING EFFICIENCY...

GREATER PROFIT

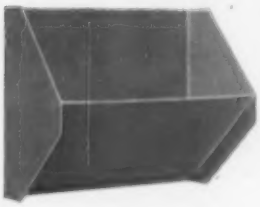
STANDARD WING TYPE SELF-CLEANING PULLEY

- **SELF CLEANING**
- **STRONG REINFORCED WELDED CONSTRUCTION**
- **LOW COST**



So strong it can withstand the most punishing loads without flinching . . . because its all-steel welded construction gives it far greater strength with less weight at lower cost.

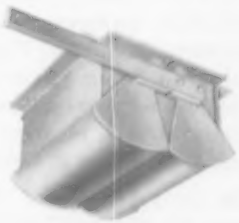
CONTINUOUS ELEVATOR BUCKET STYLE No. 2



Built to take the hardest use you can give it and come back for more, this bucket is typical of the complete line of low cost, rugged Standard Steel Buckets -- available in Salem, Style "A," shelf type and other continuous style buckets.

STANDARD BIN GATE

Speed material handling with this Standard gear-operated bin gate, which has all-steel welded construction. Other styles in Standard Bin Gates also available.



Slash material handling costs by converting to Standard. Write today for catalog showing the complete Standard line.

The Standard Metal Mfg. Co. SINCE 1921

STANDARD METAL MFG. CO.
110 CENTER ST. MALINTA, OHIO

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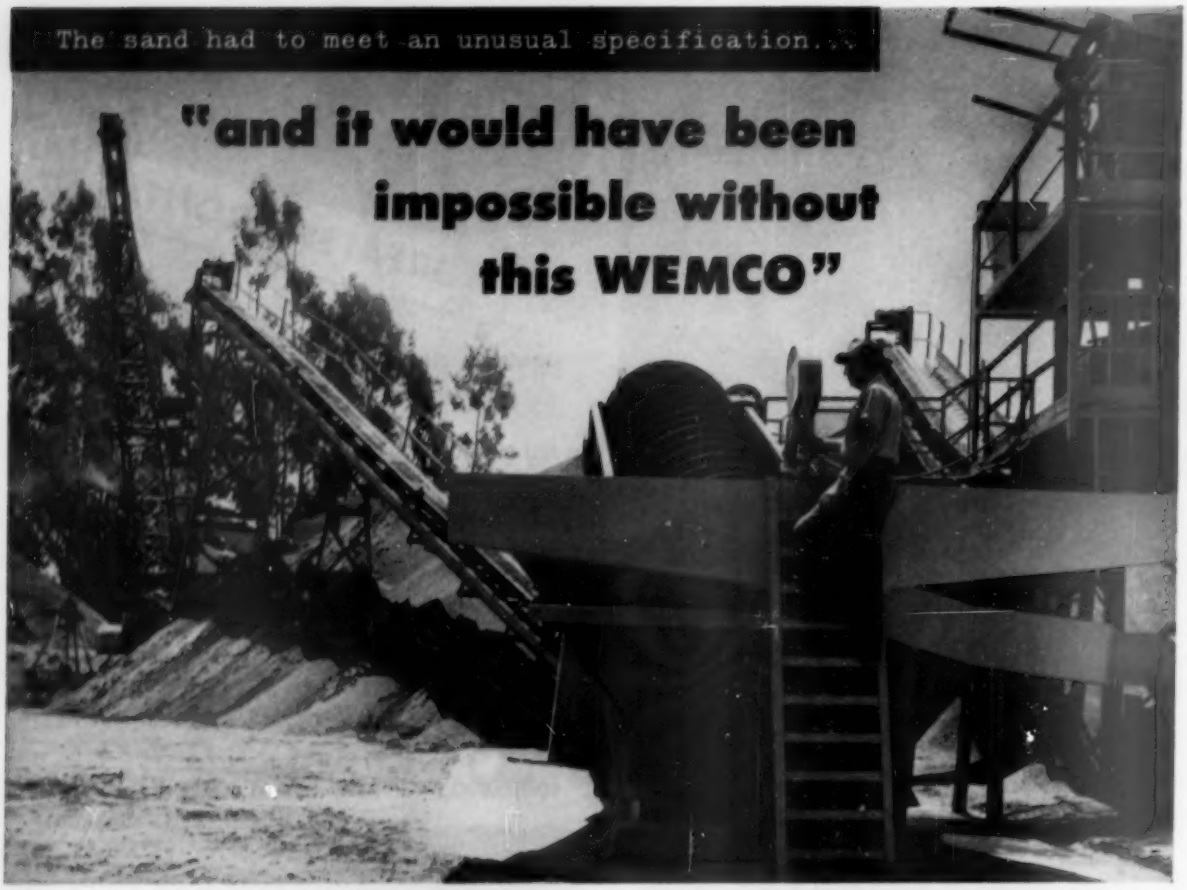
The sand had to meet an unusual specification...

"and it would have been impossible without this WEMCO"



When the Niles Sand and Gravel Company got the sand and aggregate order for the Ford Motor Company's new assembly plant in Milpitas, California, it was on the basis of an exceptionally rigid sand requirement. It has now been successfully fulfilled, and H. G. Clouser, Niles plant superintendent, reports, "this would not have been possible except for the adaptability of our 60-inch Wemco Sand Preparation Machine".

With 60,000 yards of concrete being poured on this one Ford plant, the fineness modulus was not permitted to vary more than 0.2%. Plus 200 mesh fines had to be retained in correct proportion and — 200 mesh had to be eliminated as completely as possible. A continuous materials testing program was under the direction of Hales Laboratories of Oakland.

After his experience on these very exacting requirements, Mr. Clouser of Niles Sand and Gravel Company states, "I believe that the Wemco Sand Preparation Machine, intelligently used, can meet practically any desired sand specification." "It has proven particularly adaptable to various operational changes we have made." "The hydraulic screw lift makes it readily adjustable to day-to-day pit variations." "And it has been one of the most troublefree pieces of equipment in our plant (three years running on its original wear shoes)."

Plant operator Tom Brannon using the hydraulic spiral lift. This simple adjustment compensates day-to-day pit variations, and in locations where freezing is a problem may also be used to break surface ice (eliminating the need for draining the tank for overnight shutdown).

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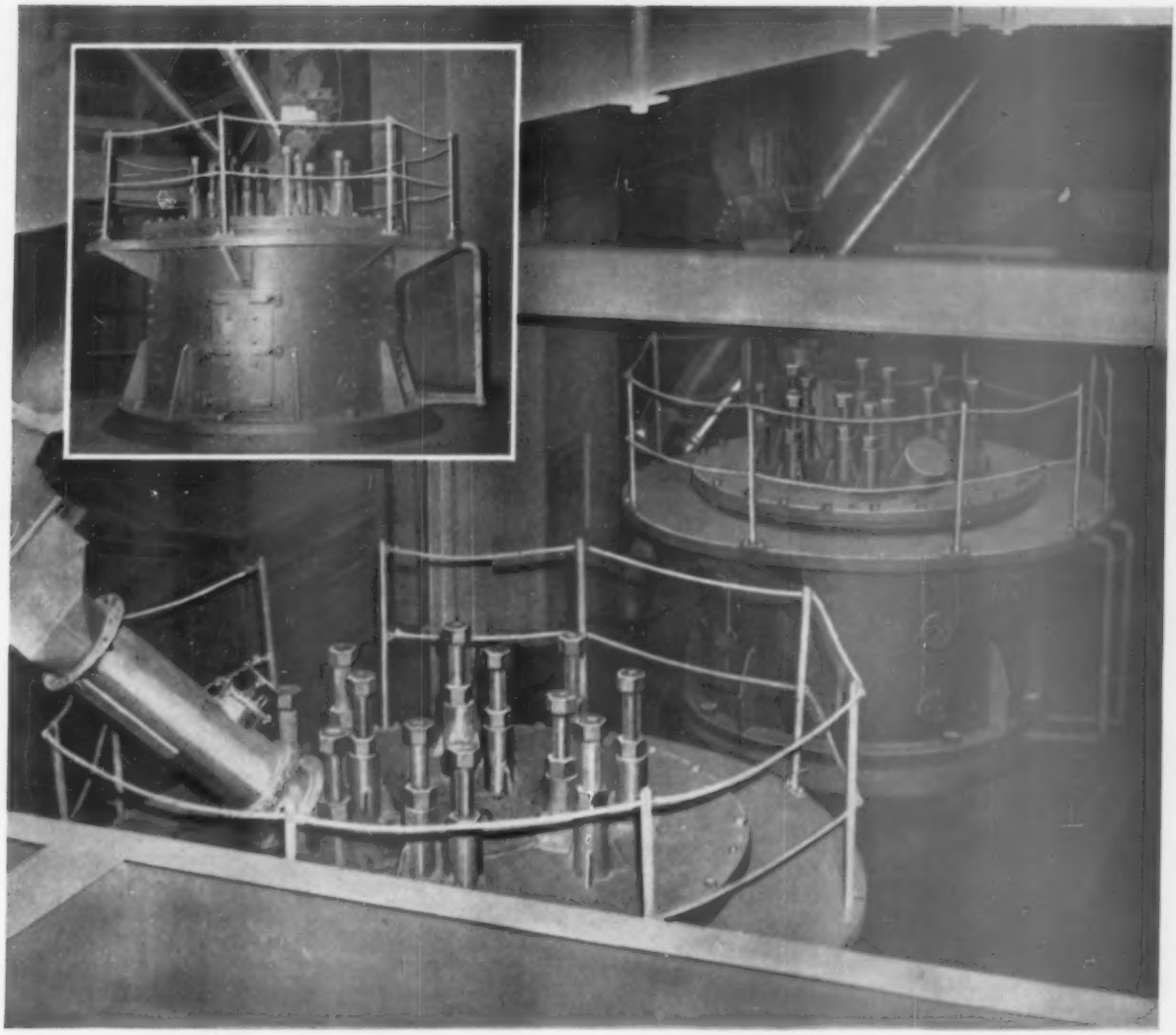

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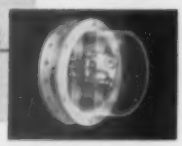

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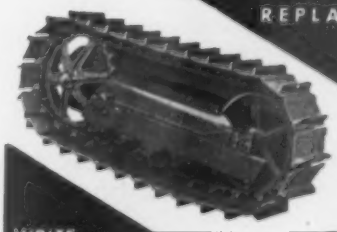

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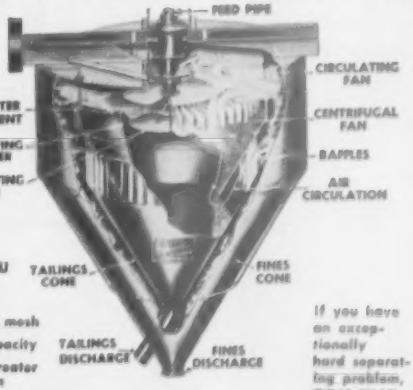

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If you have an exceptionally hard separating problem, **TRY THE GAYCO.**

Closer separations are possible with the Exclusive Gayco Centrifugal sizing fan. Higher production results from a more complete removal of the fines made by the mill. The efficient Gayco sizing eliminates all undesirable oversize from the product.

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Produces Any Grades from Standard Portland to High Early Strength

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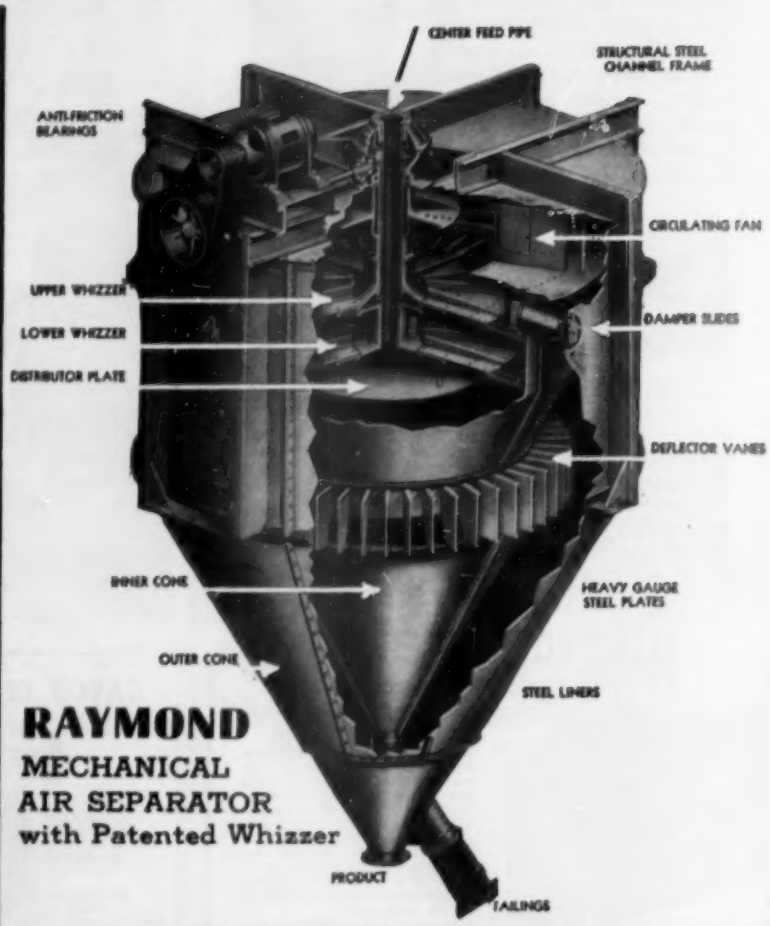
For the "Inside Story" of Whizzer Separation and its superior results in classifying all types of powdered products, write for Raymond Bulletin No. 76.



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For Classifying raw mix and cement clinker, as well as lime products and many other powdered materials, The Raymond Separator with its revolving Whizzer action does an outstanding job in making uniformly fine grades at record low costs.

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It is equally efficient for handling silicate materials, flint, feldspar and quartz (with special construction) as well as chemicals, pigments, gypsum, and lime hydrates. If you have a difficult separating problem, get the facts on Raymond Whizzer Separators.

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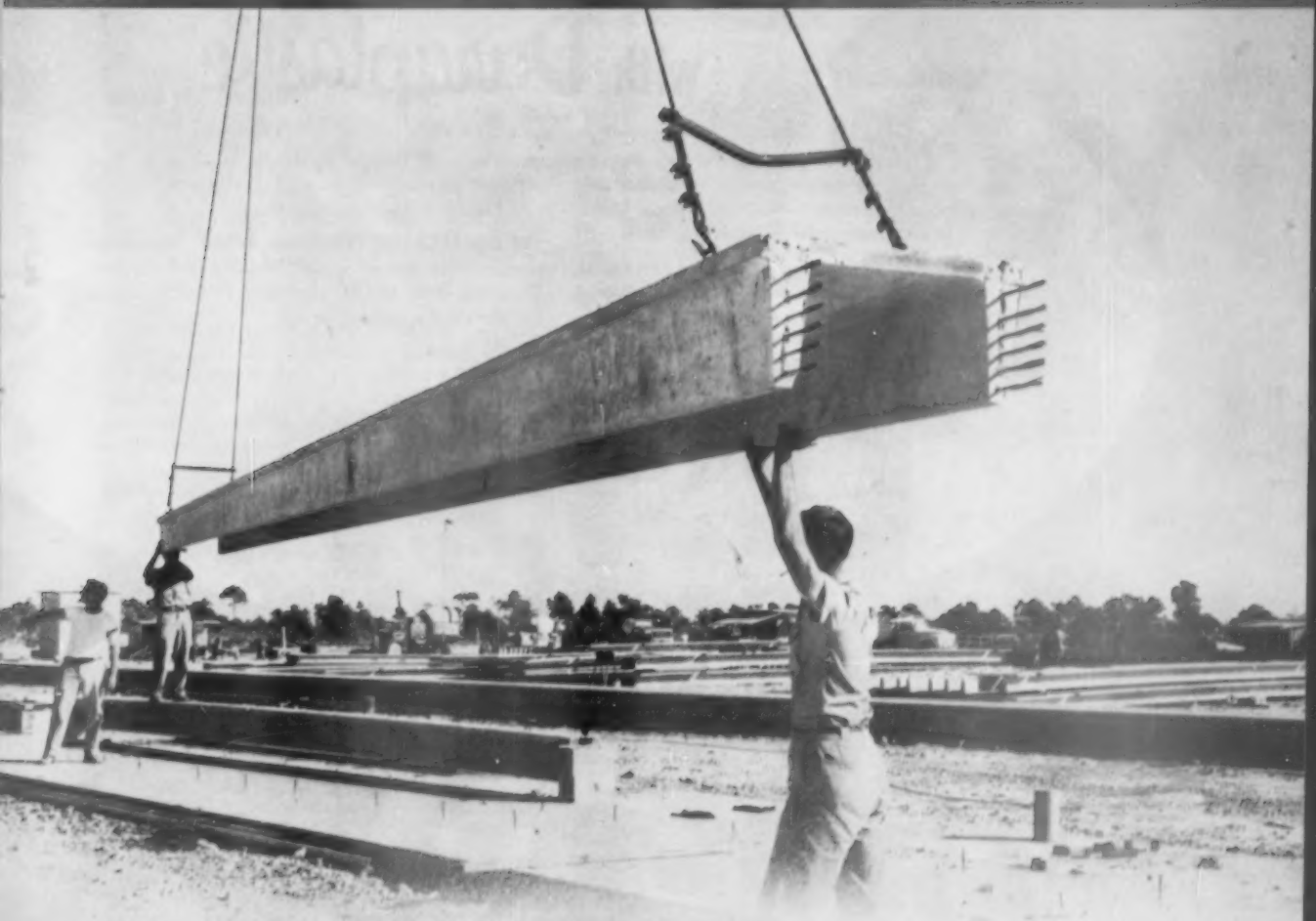
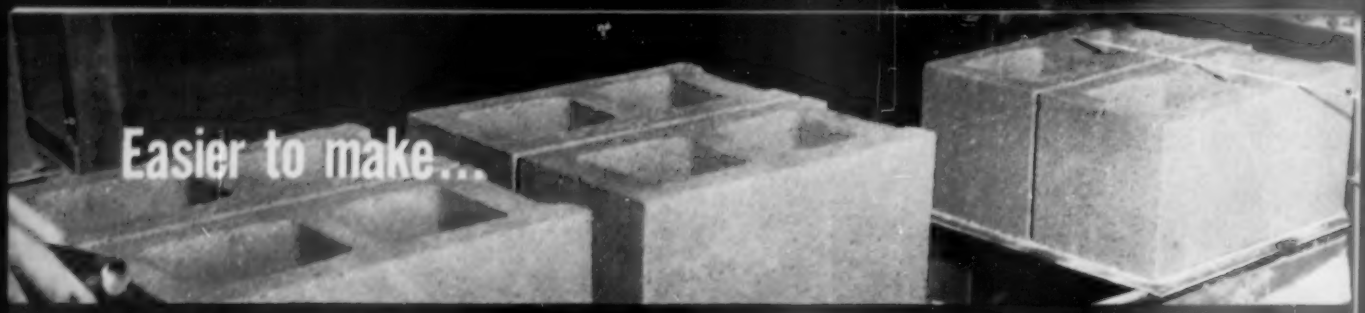


Prestressed concrete channel in casting yard of R. H. Wright & Son, Inc., Ft. Lauderdale, Fla.



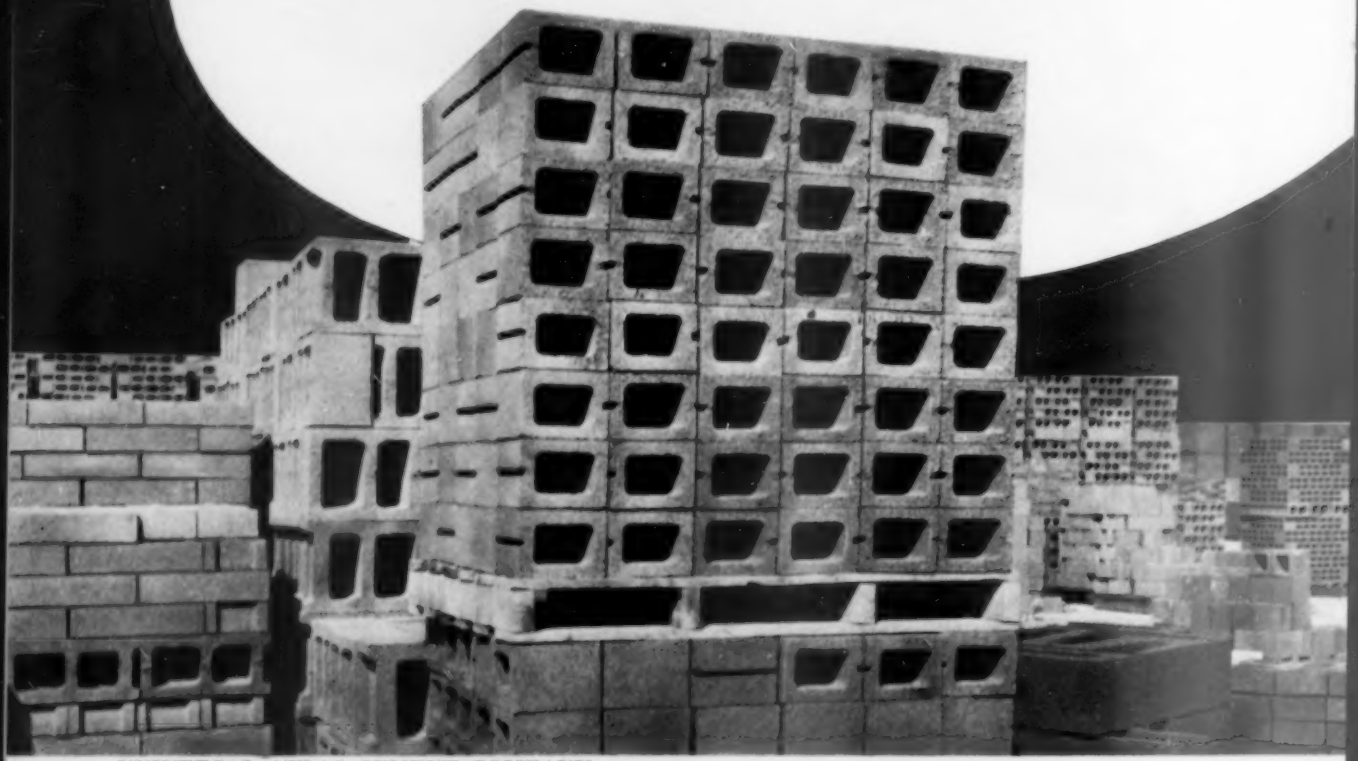
Easier to sell...

Get better products—and profits with Duraplastic

"In using Duraplastic cement, we find that we get a consistently uniform texture, with clean, distinctively sharp edges and corners," says Mr. Thomas Jewell, partner, Jewell Concrete Products, Waco, Texas.

He and other plant operators find that Duraplastic air-entraining portland cement feeds easily through machines with fewer culls and throwbacks . . . gives products with greater resistance to weather. And concrete products made with Duraplastic cement make better-looking masonry, too!

YET DURAPLASTIC COSTS NO MORE than regular cement—requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write:



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Atlas® Duraplastic Cement

MAKES BETTER CONCRETE PRODUCTS AT NO EXTRA COST

United States Steel Hour—Televised on alternate Wednesdays—See your local newspaper for time and station.

INDUSTRY NEWS

Cover Picture

ON THIS MONTH'S CONCRETE PRODUCTS COVER is shown a scene in casting yard of R. H. Wright & Son, Inc., Ft. Lauderdale, Fla. The prestressed concrete channel is one of several products manufactured by this enterprising company. Casting facilities in two yards include three Double Tee beds, each 430 ft. long for casting piling, beams, joists; one bed 100 ft. long for piling and columns; and one bed 100 ft. long for casting special reinforced concrete sections.

Slabs Widen Bridges

NELSEN CONCRETE CULVERT CO., Champaign, Ill., is manufacturing precast slabs for bridge widening. The units are available in 1, 2, 12, 16, 20, 24, 28, and 30 ft. lengths. Interior units are 3 ft. 9 in. wide, the longest unit weighing 17,000 lb. The 30-ft. curb unit, which is 2-ft. 7½-in. wide, weighs 20,000 lb.

The Indiana highway bridge widening program is using the slabs to widen more than 500 bridges. The slabs are being produced at Nelsen's East St. Louis, Ill., plant, which has been delivering enough material for 11 bridges a day, according to James Kirsch, superintendent.

Move Plant to New Site

NEW YORK COAL CO., Columbus, Ohio, has erected a ready-mixed concrete plant on Crabill Road, Springfield, Ohio, which can produce 225 cu. yd. of concrete per hour. Sixty trucks will be used to haul the material.

The plant is utilizing equipment of the company's Sargent, Ohio, plant which was taken down. Bing Parsons, formerly superintendent at Sargent, is superintendent of the new plant.

A.C.P.A. Short Course

AMERICAN CONCRETE PIPE ASSOCIATION, Chicago, Ill., announces the sixth annual Short Course of Instruction, to be held at the Chase Hotel, St. Louis Mo., October 29-31, 1956.

Installs Six Autoclaves

SOUTHERN BLOCK AND PIPE CORP., Norfolk, Va., a subsidiary of Southern Materials Co., Inc., has installed six autoclaves for steam curing of block. Starting a year ago with three autoclaves, the company has added three more, at a total cost of $300,000. The demand for the block in the area makes it an around-the-clock operation.

Increase Block Output

RYAN BUILDERS SUPPLIES, LTD., Windsor, Ont., Can., having completed a major expansion program at its Windsor plant last year, has another in sight for its London, Ont., plant. The present capacity of the two plants, with a combined use of 13 autoclaves, is 45,000 block daily. By next spring, when a new block machine and six more autoclaves are added to the London plant, the capacity will be raised to about 60,000 block per day.

New dock frontage at Windsor is being built to handle increased quantities of raw materials. The company has ready-mixed operations at both plants, and produces precast, prestressed and reinforced concrete products. There are two 400- x 120-ft. prestressing beds at Windsor and one at London. President of the company is Leo J. Ryan; J. J. Ryan is secretary-treasurer.

New Precast Plant

BADGER CONCRETE CO., Oshkosh, Wis., has opened a new plant for the production of Mo-Sai sandwich panels and of cast stone and roof slabs. The plant consists of four kilns for steam curing of slabs, a boiler room, carpentry shop, steel fabrication room and drafting room.

The company's older plant, also in Oshkosh, will continue to be used for production of concrete block and vaults.

Block Capacity Doubled

AUGUSTA CONCRETE BLOCK CO., Augusta, Ga., has undergone a $150,000 expansion program to double its output. The automatic installation is equipped to handle bulk supplies of cement, and includes new conveyors, bin, stationary mixer, and block-making machine. It can now turn out 8000 standard units per day.

Seeks U. S. Partnership

WONDERCRETE PTY. LTD., Port Melbourne, Victoria, Australia, manufacturer of masonry concrete block, is seeking a partnership with an American company in the same line. Wondercrete's 10,000 sq. ft. plant is set on 8 acres of land. Interested firms may write to the company at 97 Beach Street, Port Melbourne.

PAYSON READY MIX, INC., Payson, Ariz., has been incorporated to manufacture and deal in concrete products, sand, gravel, granite, lime, concrete aggregates, asphalt and bituminous products. The authorized capital stock will be $600,000, divided into 600,000 shares of the par value of $1 each, to be called common stock. Incorporators are Richard J. Flack, Charles W. Flack, Gorden S. Flack, Andrie G. Harrison, T. L. Meredith, Jr., Thomas O. Barkley, Mark J. Skabelund and Reid M. Skabelund.

ATLAS CONCRETE PRODUCTS, INC., Flint, Mich., has acquired the Eddy Lumber Co., Flint, and has changed its name to Atlas-Eddy Building Products, Inc. Atlas recently completed a $260,000 expansion and modernization program. Announcement of the purchase was made jointly by Sherwin Palmer, president of Atlas Concrete, and Donald Priestap, president of Eddy Lumber.

MIDWEST CELL-CONCRETE, INC., Madison, Wis., has been formed with an authorized capital stock of 1250 shares of common, no par value, for the installation of insulating concrete pipe conduits, etc. Incorporation papers were signed by Henry and Verdine Johnson, naming Millard I. Johnson as registered agent for the corporation.

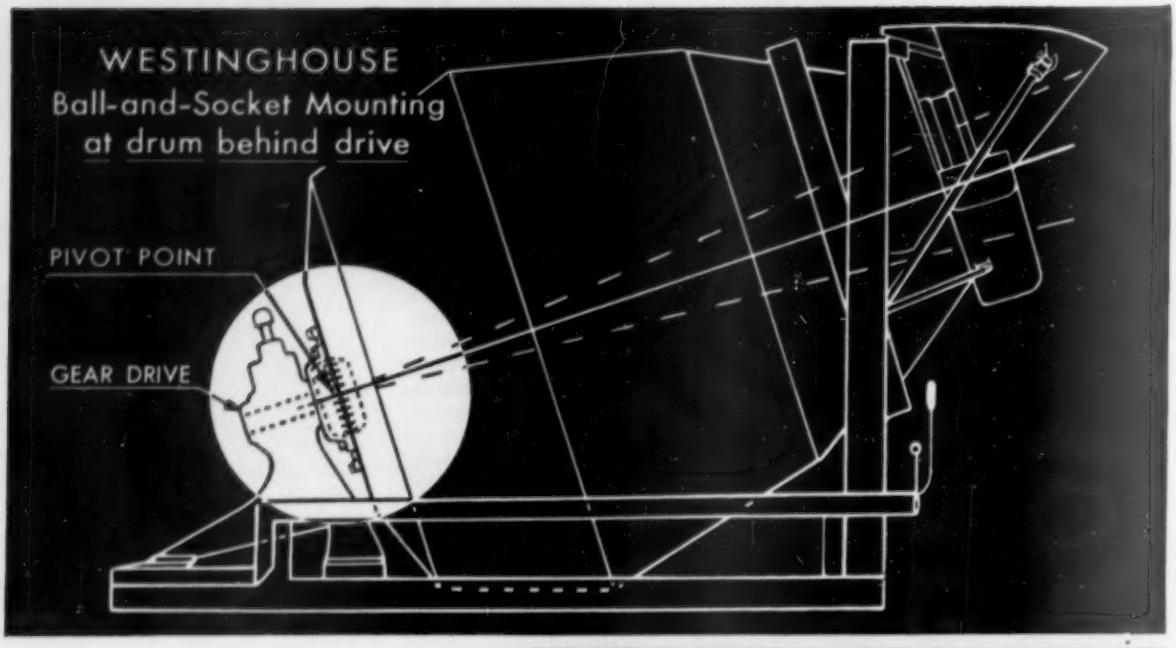
BEAVERTOWN BLOCK CO., Middleburg, Penn., announces that K. S. Kline has sold his entire interest in the company to his son, Paul W. Kline. The latter has been associated with the firm for 12 years, recently as plant foreman. He will now direct all plant and business operations.

PRE-STRESSED CONCRETE CO., INC., has been organized in El Dorado, Ark. Officers are Charles T. Tune, Henry G. Gilliam, Julian Gilliam, and Will L. Hoffman. The firm has a capital stock of $100,000.

SUPERCRETE INDUSTRIES, INC., Rapid City, S. D., has been capitalized at $250,000. Directors are Donald E. White, Richard E. Klein, Lawrence S. Rossum and E. P. Howe.

MARYLAND RAINBOW ROCK CO., INC., Baltimore, Md., has begun production of colored concrete brick. Francis Lynch is president of the company.

CAMERON CONCRETE PRODUCTS AND BUILDING SUPPLIES CO., Palatka, Fla., has opened a second plant. New facilities include a warehouse and a display room-office building.



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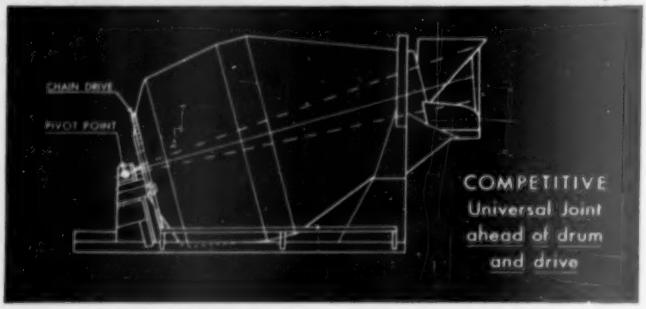

The drums on all transit mixers, except Westinghouse, are driven either by open chain or exposed rack and pinion. In spite of constant attention and lubrication such drives are subject to abrasive wear which results in jerky operation, breakage and high maintenance cost. The front drum mounting is *ahead* of such drives (see lower drawing). When the mixer travels over or stands on uneven ground the truck and mixer frames weave (as suggested by dotted lines in sketch) and the drive chain becomes too loose or too tight or the gear drive is thrown out of alignment causing excessive wear.

Now see top sketch. The Westinghouse drum is driven by husky, solidly mounted gears which are *fully enclosed*—a patented feature. They are subjected to no more wear and need no more attention than a conventional auto or truck transmission. A large drum-mounted socket with internal teeth engages a gear-driven ball with external teeth to complete the drum drive and form the front drum mounting. Since this mounting (and pivot point) is *behind* the drum drive, drum movement, caused by frame weaving, puts no stresses on the driving mechanism as is the case with chain or rack and pinion drives.

This big difference alone is causing knowing operators to switch to Westinghouse and there are other features you will like in these strictly quality machines. Westinghouse Transit Mixers, available in 4½ to 6½ yd. sizes, are fully described in a new, highly-illustrated Bulletin 256. Write today for your copy.

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TRANSIT WESTINGHOUSE MIXERS

WESTINGHOUSE TRANSIT MIXER DIVISION
LeTourneau-Westinghouse Company

INDIANAPOLIS, INDIANA

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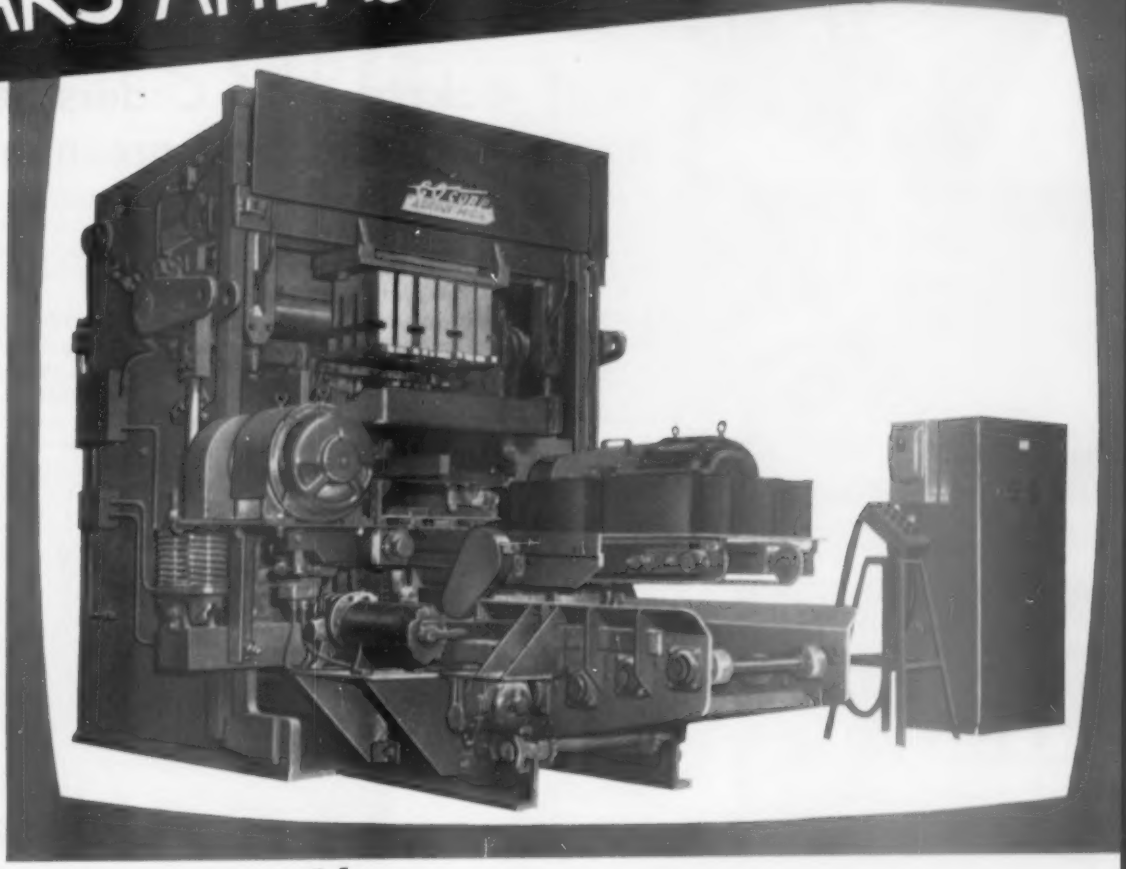
Keep YEARS AHEAD TOMORROW

WITH THE *NEW*



Hydraulic GOCORP "TRUSTEE"

NO DRAWING BOARD DREAM BUT THOROUGHLY FIELD TESTED—THE GOCORP, 3 at a time, PLAIN PALLET, "TRUSTEE" IS READY TO GO TO WORK FOR YOU NOW!

CONSIDER THESE FACTS!!!

- **HIGHER PRODUCTION**—Up to 1100 good blocks per hour, with many aggregates, *without abusing the machine.*
- **TOP QUALITY BLOCKS**—Fewer culls in production • Fewer rejects on the job • Variable cycle—for complete flexibility and constant control of quality • Accurate height control.
- **LOWER MAINTENANCE**—Hydraulic operation means fewer wearing parts • Smoother operation • The elimination of cams, cam followers and gears means big maintenance savings for you.
- **QUICK MOLD CHANGE**—Change full height molds in about 20 minutes—to other heights in about 30.
- **RUGGED CONSTRUCTION**—Heavy duty frame with heavy plate cross bracing — Heavy duty bearings — 5" dia. cross shafts • The "Trustee" is built to last.
- **NO BRAKE FAILURE**—"Trustee" vibrator motors are 10 HP plug reversing type • Designed for frequent stops and starts • No brakes to cause trouble.

The "Trustee" will accommodate, without alteration, molds of the majority of plain pallet machines now in use. You can have all the advantages of the modern hydraulic "Trustee" and protect your mold investment too!

Ask about the new GOCORP "Jet"—the 2½ X small brother to the "Trustee".

The "Trustee" machine does **not** replace or succeed the famous GOCORP "Senior" and "King" models.

GO CORP
ADRIAN-MICH.
407 Grace Street Adrian, Michigan

This is the 124th of a series of ads featuring leaders of the Concrete Products Industry who are stepping up block production with Besser Vibrapac machines.

Another BESSER BOOSTER

South Dakota Plant Orders Second Besser on Vibrapac Agreement

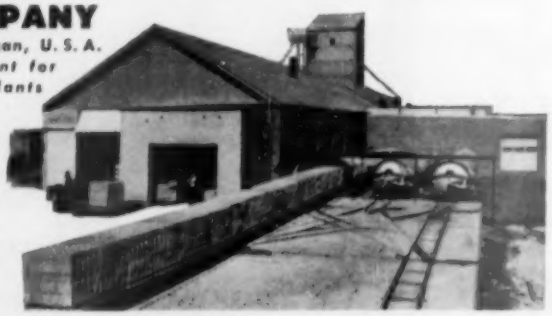
The Dakota Lime & Brick Company, Rapid City, South Dakota, started in the concrete block business in 1947. A year later they installed their first Besser Vibrapac on the Vibrapac Agreement. The satisfactory performance of this first machine, plus the profits made, prompted the company to secure another Besser in 1953. This was also on the Vibrapac Agreement.

Les Kennedy, President of the Dakota plant, states: *"The Vibrapac is unquestionably the best equipment available to produce high quality block in high production with a minimum cost for maintenance"*. He should know. His opinion is based on years of experience with Vibrapac equipment.

A modern, well-equipped plant with cash outlay greatly reduced under the Vibrapac Agreement, and with adequate stocks of aggregate within ½ mile of the plant, paved the way for success in the block business. This South Dakota plant is definitely on the way.

Les Kennedy, President of Dakota Lime & Brick, reading his copy of the Besser Digest.

BESSER COMPANY
Box 135, Alpena, Michigan, U. S. A.
Complete Equipment for Concrete Block Plants



Autoclaving in cubes. This is one of the first plants to employ high temperature presetting and high pressure steam curing of block.

New Vibrapac in the Dakota plant. No machine operator required. No manual lifting. Off-bearer merely guides the Besser Power Hoist.

Exterior view of plant which has an unusual location insofar as it is located within ½ mile of sources of cement, lightweight aggregate and sand and gravel.

Besser power cubing of block facilitates loading of block . . . speeds up deliveries.

NATIONAL HOUSING CENTER, WASHINGTON, D.C., where Besser maintains a permanent exhibit of concrete masonry. Be sure to visit this fine display.

BESSER VIBRAPAC

first in concrete block machines

A 5510-1P1

NEW

MIX-MIZER

BAD MIX PROBLEMS? UNTRAINED OPERATORS?

THERE IS A **MIX-MIZER** THAT'S RIGHT FOR YOU

SUPER MODEL

Now the instrument the industry demanded!

CONTROLS Pre-wet for lightweight aggregates

CONTROLS final moisture content in block-mix

CONTROLS THE ALL IMPORTANT TOTAL MIXING TIME

Turns the mixer off, if you wish it will even discharge the mixer.

Price.....$695.00

NEW

MIX-MIZER DELUXE MODEL

Fast, accurate—AUTOMATIC—Pre-wetting

INCREASES MIXER EFFICIENCY and output, up to 20%

Dual Automatic Water Valves

Price.....$495.00

MIX-MIZER STANDARD MODEL

Identical to the Super and Deluxe in dependable moisture control, recommended where mixer time is adequate, quick pre-wetting not required.

Price.....$395.00

ABOUT MIX-MIZERS

All MIX-MIZERS are fully guaranteed to operate 100% efficiently with standard aggregates, including lightweight. The free supervised installation, includes operator training and service.

NATIONAL READY MIXED NRMCA CONCRETE ASSOCIATION

Send for FREE TRIAL details

No obligation.

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Enter 1689 on Reader Card

FAST WORK ON TUNNEL WALLS: Jaeger's 3-speed transmission provided fast charging and discharging of 6-yard batches of 3″ to 4″ slump concrete for Detroit utility tunnel. Mixer is latest Model 5½ HMD.

ONE UP, ONE POURING, ONE AWAY: "Jaeger mixers certainly mix and handle this 2″ slump concrete beautifully," comments E. F. Matelich of Matelich & Hansen, Inc., contractors on the potable water reservoirs for U. S. Air Force Academy, Colorado Springs, Colorado. Five Jaeger "Mix Plus" truck mixers, delivering 6-cubic yard batches with a 6 mile trip-haul, poured 700 yards of 2″ slump material for the heavy floor slab.

BATCHES, LAID END TO END, MEASURE 8580 FEET: For 978 ft. Breach Inlet bridge at Charleston, S. C., Redi-Mix Concrete Company's Jaeger truck mixers supplied 1678 yards of Class A concrete and the material for 8580 linear feet of 21" octagonal concrete piling which was precast on the site.

3-speed Jaeger hits the buckets faster

Talk to any operator of the Jaeger Model "D" truck mixer. He'll tell you he would never go back to a 2-speed outfit.

With his Jaeger 3-speed transmission, he can fast charge at 16 rpm drum speed and then drop down as slow as 1½ rpm for long haul agitation. On the job he can discharge at any rate he wants. Low-low speed gives him ample power to discharge stiff concrete even as slowly as a cupful at a time. This broad range of operation is all within proper engine speed range of 800 to 2000 rpm.

With the further advantage of Jaeger's bigger throated hopper and 25% larger discharge blades, you can out-charge and out-discharge any mixer you've ever owned—often by minutes.

Another thing—today's Jaeger has an extremely short center of gravity. Mounts to advantage on standard trucks, with your choice of optional equipment including either separate engine or long-proved truck engine drive controlled from cab. For details, see your Jaeger distributor—or write us.

CLOSE CONTROL FOR BUGGIES AND BARROWS: With 3 speeds and single lever operation, Jaeger operators easily control speed and volume of discharge of any slump concrete to each customer's need—a drum-load or a cupful.

50th year JAEGER

THE JAEGER MACHINE COMPANY

603 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • PUMPS • MIXERS • PAVING SPREADERS, FINISHERS

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Drive-in Motor Lobby for

'Incor' Speeds Completion of 650-Car Garage

Dallas Adolphus Hotel

● Adolphus Hotel of Dallas is among the first to provide automobile drive-in facilities for guest registration. Hotel elevators lead directly to the Motor Lobby in the new 650-car garage, which covers 200 by 100 ft., with full basement, six floors and roof parking.

Good job planning and dependable 'Incor' high early strength made it possible to complete this durable, fire-safe structure seven months and two days after breaking ground, including time out for bad weather.

'Incor' was used in the frame as well as in basement walls, for 24-hour form removal. Result, top construction speed with fewer form sets. Same thing holds true for beam soffets and sides. Exterior street walls are concrete and glass, with lintel beams forming solid portion of walls.

Also used in 105,000 sq. ft. of precast, light-weight channels, 'Incor' made possible assembly-line production speed, with minimum forms and only a small stockpile of units in casting yard.

Big thing about 'Incor'* is profitable job speed. And along with dependable high early strength goes assured high ultimate strength as well—dual reason for insisting on America's FIRST high early strength Portland cement for lowest annual cost.

*Reg. U.S. Pat. Off.

(Left) View showing precast channels in place for first floor. (Right) photo shows manner in which floors were completed—excellent job organization and 'Incor' speeded construction of well-designed, fire-safe, durable structure.

ADOLPHUS HOTEL GARAGE
Architect & Engineer: J. N. MAC CAMMON
Contractor: COWDIN BROS.
'Incor' and Lone Star Ready-mix Concrete: DALLAS CONCRETE COMPANY
Precast floor and roof channels: TEXCRETE STRUCTURAL PRODUCTS CO.
—all of Dallas, Texas

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK NORFOLK • RICHMOND • WASHINGTON, D.C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 38,000,000 BARRELS ANNUAL CAPACITY

Enter 1650 on Reader Card

Sales analysis and payroll are processed at high speed on this equipment. Rectangular container atop machine is an "automatic tax computer"

As told to
GEORGE C.
LINDSAY

By
ROBERT
RICHEY

*Comptroller
Hilltop Building
Materials, Inc.*

Cincinnati Ready Mix Firm

Cuts Cost $18,000 a Year

Through Use of a Modular System of Accounting

IT IS SOMETIMES POSSIBLE TO SAVE TIME, effort and money through redesign of the simplest bookkeeping procedures. This is particularly true when a company has outgrown its accounting methods.

This is what happened to us. The system we used was, by most standards, highly efficient. Billing was done on high-speed electric typewriters, with specially designed continuous forms. Accounts receivable were processed on modern posting machines. An almost identical set-up is used by hundreds—probably thousands—of other com-

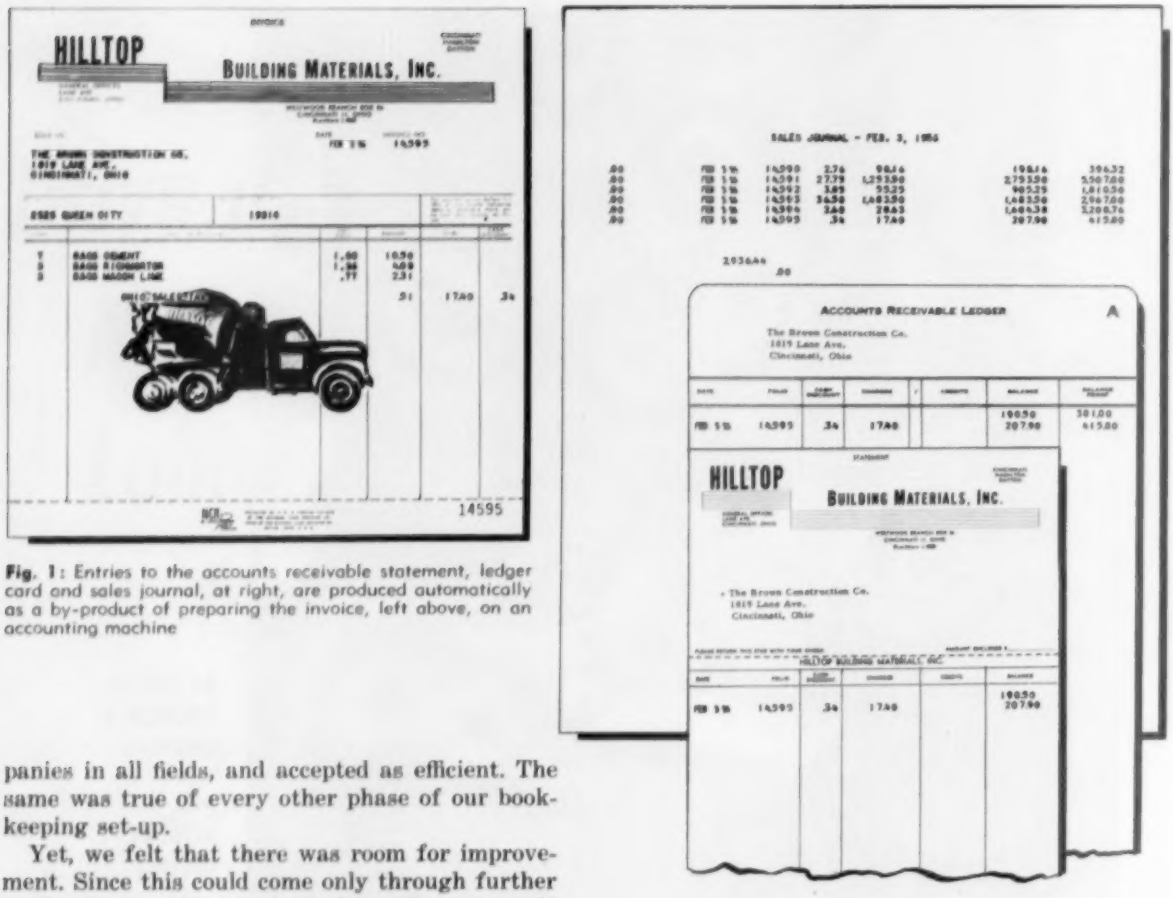


Fig. 1: *Entries to the accounts receivable statement, ledger card and sales journal, at right, are produced automatically as a by-product of preparing the invoice, left above, on an accounting machine*

panies in all fields, and accepted as efficient. The same was true of every other phase of our bookkeeping set-up.

Yet, we felt that there was room for improvement. Since this could come only through further mechanization, the easiest thing in the world would have been to jump headlong into some sort of machine system before everyone concerned really knew what it was all about. Many firms have done just that. But for us to have done so would have been most costly.

We were determined, instead, to make our own survey and analysis, matching our requirements against the capacities of every type of machine equipment available. The results were gratifying, as pointed up by this outline of personnel assigned before and after conversion to the new system:

Accounts Receivable	Formerly	Now
Billers	3	3
Posters	2	
Puller	1	
Sales Analysis	1	½
Miscellaneous		½
Payroll	2	1
Accounts Payable	3	1
TOTALS	12	6

Nor is this the whole story. We receive much more information from the system now used, and it is in up-to-date, legible, completely accurate form. Overtime, which at one time was a problem, has been eliminated. The entire system is modular in nature; that is, it may be expanded almost without limit to meet future needs.

There is little question but that similar methods could be used by many other companies. With that thought in mind, here is a brief description of each part of the set-up as it is now used.

Sales analysis, or a discussion of it, should come first because all delivery tickets are analyzed, proved, and controls established before going to the billing-accounts receivable section. The analysis and proof job is done on a National "142-A" payroll and analysis machine. The same equipment is also used for payroll.

The operation is truly simple. Taking one delivery ticket at a time, the machine operator enters each amount on an adding machine-type keyboard. This is done by touching the proper button, according to 34 sales classifications.

After each delivery ticket, a dial in the machine shows the total amount for that ticket. Thus, the addition on each ticket is automatically proved as a by-product of the analysis operation.

When all tickets for the "run" have been put through, the machine yields totals for each of the

Bob Richey comments, "The entire system . . . may be expanded almost without limit to meet future needs

34 sales classifications plus an over-all accounts receivable total. Separate runs are made for each of our nine plants in the Cincinnati area, plus brokerage.

Formerly, it required one girl just to analyze sales by three main classifications: Ready-Mix, Building Materials and Brokerage, and to get a breakdown of taxable, non-taxable and sales tax. At that time, we had no detailed sales statistics at all. Half of one girl's time is now spent in producing our sales analysis.

After all analysis has been completed, delivery tickets are sorted into three accounts receivable controls, add-listed, and proved back against a recap of the ten over-all accounts receivable totals yielded by the machine runs for each plant. The tickets are then sent to the accounts receivable section.

Billing and accounts receivable have been combined into one operation. Three National "32" typewriter-bookkeeping machines are used for this work. Cash receipts also are posted on the same equipment. We have an average of about 900 charge postings (350 invoices) and 130 cash entries a day. On a peak day, 1500 charge postings (600 invoices) and 200 cash entries are made.

As shown in Fig. 1, the invoice is placed in the left side of the machine's carriage; it is automatically dated and consecutively numbered by the machine. Name and address and all description are typed on the machine's electric typewriter; amounts are entered on the adding keyboard. The invoice is totaled automatically by the machine, which then moves over to the ledger card and enters date, invoice number, cash discount, total charge, new balance, and balance proof—all automatically.

The customer's old accounts receivable balance is picked up and proved mechanically, even before the invoice is put in the machine. The pick-ups do not print, but the machine tests them for error; if they are correct, "OO" prints on a journal tape

Four modern typewriter-bookkeeping machines speed Hilltop's accounting work. Notice the "control bars" hung on racks against the wall; these instantly convert the machines to any application desired

at the left. If an error in pick-up has been made, the amount of that error prints (instead of "OO") and then is corrected immediately.

Observe that the combining of the billing and accounts receivable jobs enable us to use exactly half as many people on this work. Billing on a machine of this type is fast, because all figures are entered on an adding machine-type keyboard. Punctuation and tabulation are automatic. For example, the carriage must first be **positioned** in the proper place to enter a figure on a typewriter; that is, if the previous figure were $125.00 and an entry of $10.00 is to be made, the "1" must be positioned below the "2" in $125.00 to line up the amounts correctly. Then 1-0.-0-0 would have to be typed. On our billing machine, the $10.00 would be entered at one stroke, and no positioning or tabulating is necessary. Other factors, such as automatic dating and numbering, and a virtually automatic accounts receivable posting make for high speed.

The assignment of each accounts receivable control to a specific girl, using her own machine, is another factor that insures accuracy.

Efficiency of the accounts payable and general ledger operation is indicated by the assignment of one, rather than three, people to this work. Processes of accounts payable vouchering, journalizing, distributing to the proper accounts, and even writing the check have been combined into a "one shot" operation on one typewriter-bookkeeping machine. A voucher always is prepared and distribution is made at the same time. Then, if the voucher is to be paid as of this date, the check is written immediately. If not, the voucher is placed in the unpaid file, by due date.

Proof that the amount distributed was equal to the amount vouchered is an inherent and automatic part of the machine operation. Balances on both voucher and ledger are also mechanically

Hilltop's modern Cincinnati office building is located—as company name suggests—near the top of a hill

proved. Expenses are entered to subsidiary ledgers, as shown. We have over 500 distributions of this kind. A cost analysis for each plant is maintained by this means. Assets and liabilities are distributed directly to general ledger accounts.

At the end of the month, the subsidiary ledgers are closed to the general ledger. As a by-product of this operation, the year-to-date figure on each ledger card is computed automatically and printed by machine.

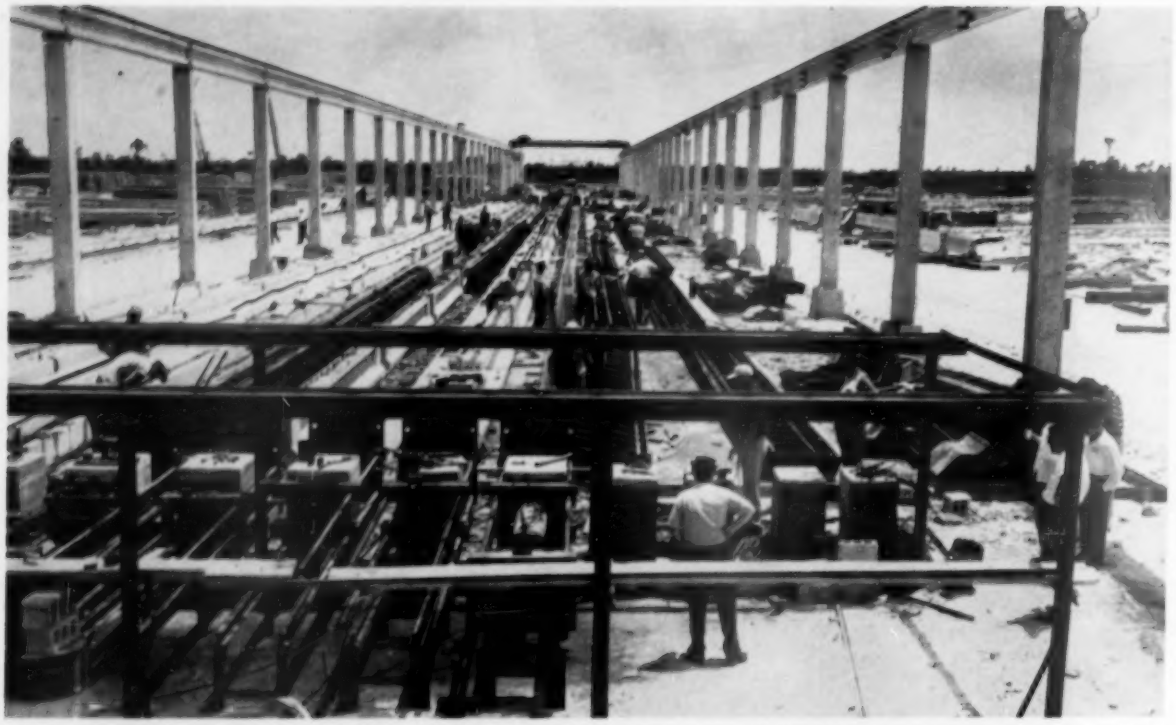
All general ledger postings, whether they originate from accounts payable or some other source, are machine-posted. In making miscellaneous entries, a general journal is printed at the same time. Entries like payroll, taxes, and depreciation are made during the month, thus avoiding a month-end peak.

The payroll for 380 people is processed on the same equipment that handles the sales analysis job. Entries are made daily at the bottom of each employee's earnings record. Then, at the end of the week, all information needed to write the payroll is right on the earnings records. Fixed deductions and number of dependents are written permanently on the last line.

All related forms are prepared simultaneously, just as with other machine procedures. Gross and net pay are figured automatically by the machine, which also prints to-date figures for earnings, city tax, and combined withholding and F.I.C.A. on each earnings record. Earnings are classified automatically and totaled by "Under $3000," "$3000 - $4200" and "Over $4200" — which eliminates endless analyzing and recapping to get these figures. Checks are automatically dated, numbered and protected by the machine. The vertical journal columns, including those for deductions, are individually totaled as the payroll is written.

Quarterly and annual Federal and state reports also are prepared at high speed by machine. The rush and confusion normally associated with these periods are things of the past.

No part of the new system required new or specially trained personnel. Our own people learned to operate the equipment quickly. All records are in readable, up-to-date form from one day to the next; we can obtain any figure, at any time, immediately—a great asset in this business. Another benefit is found in relations with customers: nothing pleases a customer more than to receive a 100-percent accurate, understandable statement of his dealings with us. "Normal" peak accounting periods have been reduced to a ripple. All this, and a $1500 monthly saving too!



Looking down 1020-ft. craneway spanning two 430-ft. casting beds at Deerfield yard. Two 10-ton cranes are used to set and strip forms, pour concrete and move completed units from casting beds to storage

Prestressed Concrete Is A Big Business In Florida

TWO CASTING YARDS . . . operated by R. H. Wright & Son, Inc., are busy supplying highway bridge structures, and many types of buildings with beams, joists and columns

By C. E. WRIGHT

THE TWO CASTING AND PRESTRESSING YARDS of R. H. Wright & Son, Inc. are playing a major part in the construction of the Florida turnpike. When present contracts are completed, Wright will have supplied about 36,000 lin. ft. of prestressed concrete bridge beams and 300,000 lin. ft. of prestressed piling to contractors for the "Sunshine State Parkway."

The Ft. Lauderdale, Fla., firm is manufacturing prestressed members for all turnpike bridge contractors except Cleary Brothers Construction Co., West Palm Beach, which has its own fabricating yard.

Of the 86 bridges on the turnpike being built from Miami to Ft. Pierce, 28 are of prestressed concrete construction. This is one of the factors that has contributed largely to lower construction costs, figured at $470,000 per mile, compared with other turnpikes that have cost a little above this figure to millions of dollars per mile. Overall savings on the turnpike have been about $16 million, with $12 million saved on contractors' bids alone. The aggregate cost of the 110 miles will be $58 million against a pre-construction estimate of $74 million.

A pioneer in the manufacture of prestressed concrete, Wright & Son established its first yard, Deerfield, in 1954 at north Pompano Beach, Fla. Shortly afterward the Dania, Fla., yard was installed. The combined casting facilities of the two yards include: three Double Tee beds, each 430 ft. long for production of floor and roof slabs; four flat beds, each 430 ft. long, used for casting of piling, beams, joists; one bed 100 ft. long for piling and columns, and one bed 100 ft. long for casting special reinforced concrete sections. Both yards are serviced by an overhead crane system. At Deerfield, the craneway is 1020 ft. long and 56 ft. wide with two 10-ton P & H cab-operated cranes. The Dania yard has a craneway 920 ft. long, 56 ft. wide, on which two 10-ton P & H cranes are mounted.

Wright's prestressing yard at Dania covers 11 acres. A new 500-ton Johnson batching plant was recently installed with the Octo-type bin for cement storage in the middle surrounded by six compartments for aggregate. This batching plant supplies the prestressing requirements of the casting yard, and furnishes transit-mixed concrete for the turnpike and other public and private construction jobs within a 15-mi. radius. The firm has a fleet of 39 mix trucks, all equipped with two-way radio. There are six Marietta concrete silos for aggregate storage. These storage bins are served from railroad cars and trucks by bottom-dumped underground conveyors.

The Dania yard is well situated on the Dania cut-off canal and adjacent to the Seaboard Railway trackage, which means shipments of materials and finished members can be barged via the Intracoastal Waterway and the New River and dispatched with ease by rail transportation.

The Deerfield plant covers 43 acres about 15 miles north of Ft. Lauderdale. The yard was started in 1954 and equipped with one 100-ft. casting bed. The first prestressed members for the turnpike were cast there in October, 1955. Constant expansion and addition of more casting beds has enabled the firm to produce turnpike beams and piling on a daily basis. A majority of the turnpike beams are 47 ft. long, with some 60 ft. The Wright firm estimates that the turnpike contracts will require 4,000,000 ft. of high strength strand reinforcing.

The Deerfield plant is served by a batching plant assembled from sections of an old plant formerly in use at Ft. Lauderdale and with the addition of new parts. It is used to serve the needs of the prestressing operation and for outside jobs. Concrete for casting is trucked from the batching plant in transit mix trucks and deposited in buckets which are picked up by the overhead crane and poured into the beds. Strand is brought in to the plant's sidetrack on railroad cars. Two hydraulic tensioning jacks, one of 200-ton, the other of 300-ton capacity are used in the pretensioning operations. Turnpike bridge beams are under tension for five days, piling for three days. Steam curing can be used on all Wright prestressed members, the steam being furnished by a 180-hp. boiler through pipes laid underneath the forms. Besides its overhead crane system, the yard also utilizes two Lorain mobile cranes, rubber-tired and self-propelled, one of 17-ton and the other of 25-ton capacity.

In addition to turnpike work, Wright has recently been engaged in several other major contracts. These include

Two 75-ft. beams loaded on trailers for delivery to Biscayne Shopping Center, Miami. The beams, said to be the longest precast units produced in Florida, are for a pedestrian bridge in the shopping center

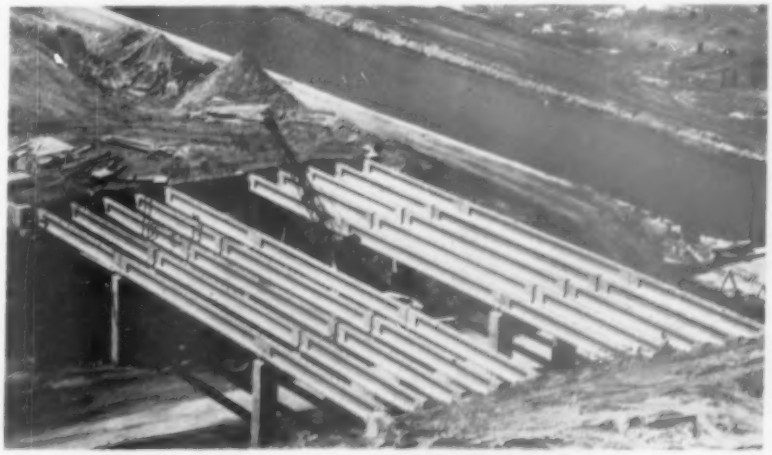
fabrication of beams 75-ft. 10-in. long for a pedestrian overpass in a Miami shopping center, beams and Double Tee roof slabs for a 13-room school in Ft. Pierce, Fla.; columns, beams and slabs for a new U. S. Postoffice annex being built in Ft. Lauderdale, and 36,000-ft. of I beams for the huge 163rd St. Shopping Center in Miami.

Prestressing operations in Florida have been given a considerable boost by the interest in the process that has been shown by W. E. Dean, Chief Bridge Engineer, Florida State Road Dept., who is credited with having advocated prestressed concrete construction for bridges long before other governmental engineers adopted this method. At a meeting of the Highway Research Board, Mr. Dean recently made this statement:

"Any process or procedure likely to result in cost savings in simple bridge building is worth considering, as a rather small saving on a single span, if applied to a large number of spans, can amount to an important sum. Prestressed concrete entered this field approximately four years ago, and its use has resulted in substantial economies in both the longer bridges with many identical spans and lately, in the shorter structures of only a few."

At a recent convention of the Prestressed Concrete Institute at Hollywood, Fla., he stated that if structural steel had been used many of the current bridge jobs of the State Road Dept. in Florida could not have been completed on schedule because of delayed steel deliveries. In some cases where delay was inevitable and steel was to be used, the projects had been renegotiated in prestressed concrete.

A similar view is held by the Florida State Turnpike Authority, which, in addition to saving money by using prestressed concrete, has apparently made possible the completion of the Miami-Ft. Pierce turnpike by the target date Jan. 1, 1957. By the time this



Boynton Beach Road overpass of the Sunshine State Parkway is constructed with 30 Type C precast prestressed beams

Restaurant in Deerfield Beach, Fla., is an example of how prestressed concrete joists cast with a special lip to receive Tectum, a wood fibered roof deck, produces an attractive ceiling for this type of structure

appears in print work may have been started on the $185 million extension of the Florida turnpike to a point near the Georgia line above Jacksonville, which will make it the longest toll turnpike within one state in the country. This 275-mi. extension will presumably continue the large use of prestressed concrete in light of the favorable experience on the south Florida portion.

In the longer hauls necessary to supply prestressed members to the northern portion of the turnpike, south Florida prestressers may be at somewhat of a disadvantage in hauling costs, though this may be offset by the economies that have been worked out through mass production techniques. In supplying the south Florida turnpike project, Wright has had hauls up to 90 miles. R. H. Wright & Son has found it economical to have its hauling done by outside contract haulers. Its sales contracts are made on an f.o.b. yard basis, with separate contracts for hauling. George Ford, a company vice-president says, however, that hauling up to 200 miles can be done within a reasonable economy range.

R. H. Wright & Son, Inc. started in business in 1942 and was incorporated in 1945. Its main office is at 1050 N.E. Fifth Terrace, Ft. Lauderdale. The office of the prestress section is located at 1123 N.E. Fourth Ave., Ft. Lauderdale. Officers of the company are: Wyatt B. Hodges, president; R. H. Wright, vice-president; L. E. Davis, secretary-treasurer; E. D. Soady, vice-president and general manager of the construction department. George W. Ford, vice-president and general manager of the concrete department, was second president of the Prestressed Concrete Institute formed in 1954.

The concrete department employs about 200 persons in all its divisions. Its Deerfield casting plant has 85. The prestress section office is staffed by nine persons, including one draftsman, three graduate engineers and cost control personnel. The Deerfield prestressing operation is in the charge of J. A. Walker, while the Dania yard is managed by Tommy Bass. Both of these men work under the direction of Paul Clark, general superintendent of prestressing yards. Arthur Parks is in charge of the Deerfield concrete plant; Bert Addy heads the Dania plant.

In the field of concrete manufacture the company attributes a large part of its success to a complete laboratory at its main concrete batching plant in Ft. Lauderdale. Gordon Carpenter is in charge of the laboratory which does not rely entirely on its own findings, but double checks with outside laboratories to insure against any failure to detect flaws in its work.

Prestressed, double Tee roof slabs being delivered to the new U. S. Post Office Annex in Fort Lauderdale. This job also includes prestressed columns and beams

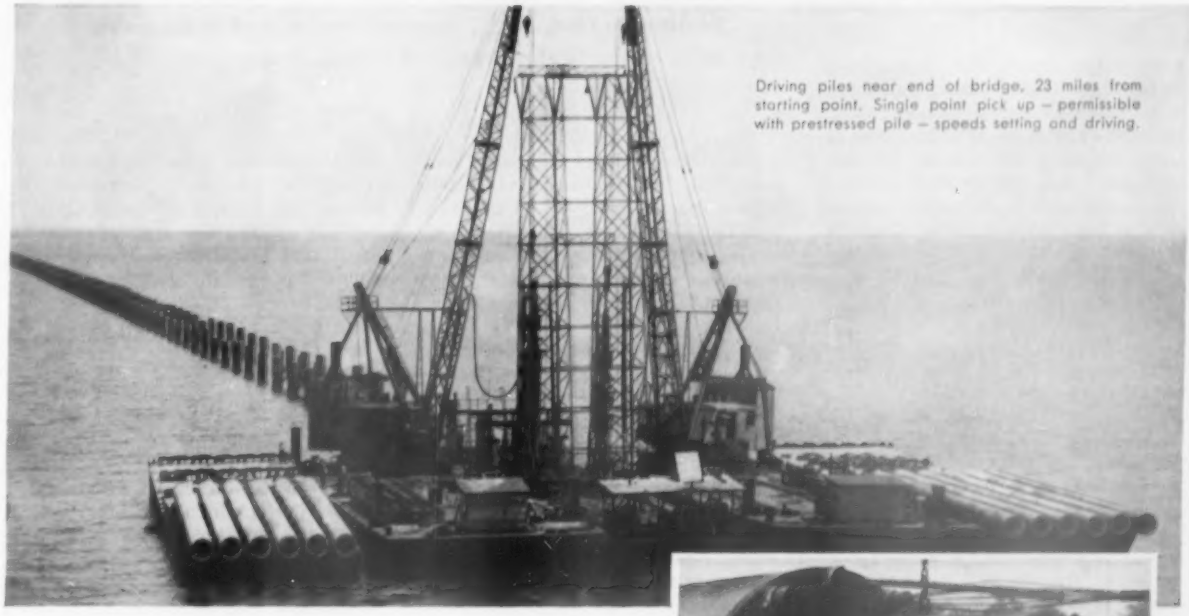
Hereford Has New Plant

HEREFORD CONCRETE PRODUCTS, INC., St. Louis, Mo., is constructing a new building, 60- x 200-ft. The plant will include an air-conditioned office, locker and utility rooms, and a casting room, the latter to be served by bridge cranes and electric hoists. A fork truck and yard crane will handle products to yard storage and will load trucks for delivery. Aggregates will be weigh-batched to a 16-ft. mixer and concrete will be taken to molds by a bottom-dump bucket on a bridge crane.

Correction

WE HASTEN TO CORRECT a typographical error that appeared on page 155 of the September 1956 issue of ROCK PRODUCTS. A surface moisture meter used by Empire Builders Supply Co. at its Niagara Falls, N. Y. plant was incorrectly referred to as a "C. & S." meter. Correct designation is "C & W." surface moisture meter, which is manufactured by C & W Sales Co., Inc., Menlo Park, Calif. We regret the error.—THE EDITORS.

PRESTRESSED CONCRETE
10th ANNIVERSARY



Driving piles near end of bridge, 23 miles from starting point. Single point pick up – permissible with prestressed pile – speeds setting and driving.

TEN YEARS AGO this month the first successful application of prestressed concrete in the U. S. was completed – the prestressed concrete portion of Roebling's Chicago Warehouse. Four years later the first prestressed concrete bridges in this country were completed – tensioned, of course, with Roebling materials. And during that interval we increased our knowledge through constant research plus the design and fabrication of prestressed concrete decks on several of our Central and South American suspension bridges.

As this new material has caught on with ever-increasing rapidity, engineers and fabricators have turned to us for information on materials and methods. This collaboration has not only helped *them* but has kept *us* constantly abreast of new developments and new requirements in tensioning elements.

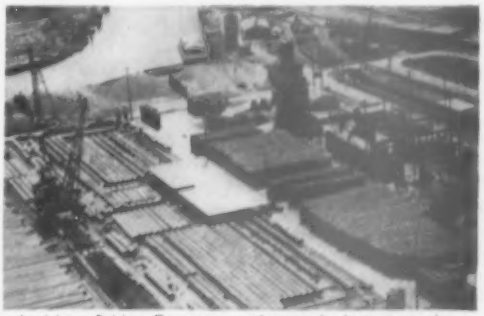
An example of Roebling's position as America's foremost supplier of tensioning materials is the Lake Pontchartrain Bridge, utilizing 123,000 miles of .192" diameter Roebling wire for prestressing the piles supporting this 24 mile long structure.

When you need tensioning materials or have a problem in prestressed concrete, why not turn to headquarters for suggestions and advice on specific applications? Contact Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

•

Builders; Louisiana Bridge Co., Mandeville, La. (a joint venture of Brown & Root, Inc., Houston, Texas and T. L. James & Company, Inc., Ruston, La.). Designers, Palmer & Baker, Inc., Mobile, Alabama.

Post-tensioning the cables. Piles are 54" outside diameter, 80 and 96 feet long, and stressed with 12 cables each containing 12 wires, .192" in diameter.



Louisiana Bridge Company casting yard where more than 900 feet of the Cen-Vi-Ro type piles were fabricated per day under special license agreement with Raymond Concrete Pile Company of New York.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation CF&I

Enter 1609 on Reader Card

Cinder Block Producers' Conference

National Cinder Concrete Products Association meeting in Atlantic City, N. J., discusses methods of overcoming failures due to shrinkage and volume changes

INSPECTION TRIPS and a program covering important developments in manufactured lightweight aggregates, methods of overcoming failures due to block shrinkage and volume changes, and new block applications drew a good attendance to the annual conference of the National Cinder Concrete Products Association, July 30 to August 1, in Atlantic City, N. J.

A day was spent inspecting many concrete masonry installations at McGuire Air Force Base adjoining Fort Dix, N. J. Most of the block had been supplied by the Bethayres Concrete Products Co., Inc. Charles Lower, who heads this company, gave detailed information about design and construction features of the buildings completed and under erection. His company's block are made with an anthracite cinder aggregate that imparts a pink color to the finished product. The block are moist cured, not steam cured.

Failures from block shrinkage and volume change were practically eliminated through the use of contraction joints and steel wire mesh reinforcement over different stretcher courses; also ample use of bond beams, made up of U-shaped block, with reinforcing wire and rods embedded in the concrete block filling. In only one case was any trouble experienced, and that was in a 65-ft. high wall subjected to violent rainstorms and high winds. Application of two coats of transparent silicone paint resulted in a water-tight condition. Theodore Leba, Jr., representative of N.C.M.A. in Washington, D.C. was given much credit for promotion of concrete block use in government structures.

Mr. Lower displayed a 28- x 48-in. chart prepared by his company for distribution to architects and engineers that showed details of bond beams, control joints and reinforcement, typical door framing, concrete wall and column construction. The Eastern Concrete Products Association also showed a 28- x 40-in. chart prepared for engineers and architects. This chart comprised tables, plans and drawings covering the use of concrete block in home construction.

Lightweight Aggregates

At a session on manufactured lightweight aggregates, William Atkins of the Lelite Co., described how Lelite is manufactured from anthracite coal waste. As the source material contains 28 percent carbon it provides its own fuel in conversion to a ribbon of clinker which is crushed and screened to provide desired sizes. Martin Gelbman of the Expanded Aggregates Corporation, Bangor, Penn., asked Mr. Robinson to describe how aggregates are made from a slate quarry refuse. A production of 1000 cu. yd. per day is planned. Walt Warren of the Waylite Corporation reported that the new Youngstown, Ohio plant will have an output of 1000 cu. yd. of aggregate per day. William Bower, who represented a company dealing in cinders, stated that cinders were becoming scarce as the power companies were increasing the use of pulverized coal which did not produce cinders.

S. H. Westby, manager of the Housing and Cement Products, Portland Cement Association, told about the association's studies on block shrinkage, effect of carbonation, and also studies on load bearing values of block when laid up in other than stretch bond. He also mentioned studies involving the best curing temperatures for different block types, work on mortar bonds and on new types af aggregates. He stressed the importance of initiating advertising campaigns in good business periods. Starting advertising when business begins to slump is too late and of little value. He cited an example of what could be done in getting additional business. A small house built of wood with 1000 block for basement construction, could develop into an additional 1000 block for walls and a further addition of 1000 block if the floors were of block construction. Sales of block, he said, could be increased from 2.7 billion per year to 8 billion a year.

High Pressure Curing

William J. Shore, Shore Engineering, presented a paper covering developments in autoclave block curing systems and the corrosion problem in both low and high pressure curing. The discussion on high pressure curing covered installation costs, quick-opening doors, gaskets, dimensions of autoclaves, loading bridges, steam generators, insulation of cylinders, two-phase curing, fuel economies, blowdown silencers, and prospects of automation. Intensity of corrosion is influenced by the type of aggregates. Admixtures apparently do not influence corrosion. Corrosion may be reduced either by preliminary treatment and beneficiation of aggregates, and/or admission of strong alkalies to drum during the cycle to neutralize production of corrosive acids.

Jack Franklin of the Besser Co., told about his company's publicity efforts in various media to promote greater use of concrete masonry units. He told about his recent trip to Europe where the per capita use of concrete block was far greater than in the United States. One housing development used 40,000,000 block, and a manufacturer in Holland closed an order for 45,000,000 concrete brick for new roads. Mr. Hultmark of the Stearns Manufacturing Co., described his company's new Z block machine which completes six cycles per minute. Jos. Wolff showed two movies of low-cost housing in Africa using a new type of block. The block sides are in two slabs held together by three reinforcing rods forming a full cavity wall. The block are designed to nest or interlock one with the other. The Presto Brick Machine Co., has set up a new plant in the Bronx, New York City to make the block.

Representatives of various types of block unloaders briefly outlined the advantages of their equipment. Discussion indicated that any type of equipment that cut labor costs would have a ready market in the block industry.

N.S.G.A., N.R.M.C.A. Course

NATIONAL SAND AND GRAVEL ASSOCIATION and National Ready Mixed Concrete Association, Washington, D. C., are sponsoring their eleventh annual Short Course of Instruction for Industry Technicians at the University of Maryland November 26-30. The course will include discussions related to bituminous mixtures in addition to the more comprehensive instruction on concrete and concrete aggregates.

EFFICIENT WORK BARGE SET-UP consisted of revolving derrick with 130' boom and 4-way pile driver.

Prestressed wharf piles resist side loads and salt water

FOR ESSO STANDARD OIL'S new bulk oil terminal at Newport News, Va., Tidewater Construction Corp. has erected a wharf on concrete piling of interesting design. The piles, (72' to 77' long and 18"x18" in cross section with 8" dia. hollow core) were cast at the site and prestressed with sixteen 3/8" cables pretensioned under a total load of 112 tons. This prestressing stiffens the piles against side loads created by the thrust and pull of loaded tankers and barges. It also holds closed any cracks which develop in the concrete, so as to prevent exposure of the steel reinforcing to salt water.

The high early strength concrete needed for this construction was supplied by an 8½ bag mix properly processed in truck mixers of certified design, capacity, mixing speed and water control accuracy. It tested 4000 psi after 72 hours.

21 PILES AT A TIME were cast and prestressed in 7 lines of 3 piles each. Forms were reused 12 times.

CONCRETE was placed and vibrated around fibre Sonovoid tube, centered in form to create a weight-saving, cost-saving hollow core.

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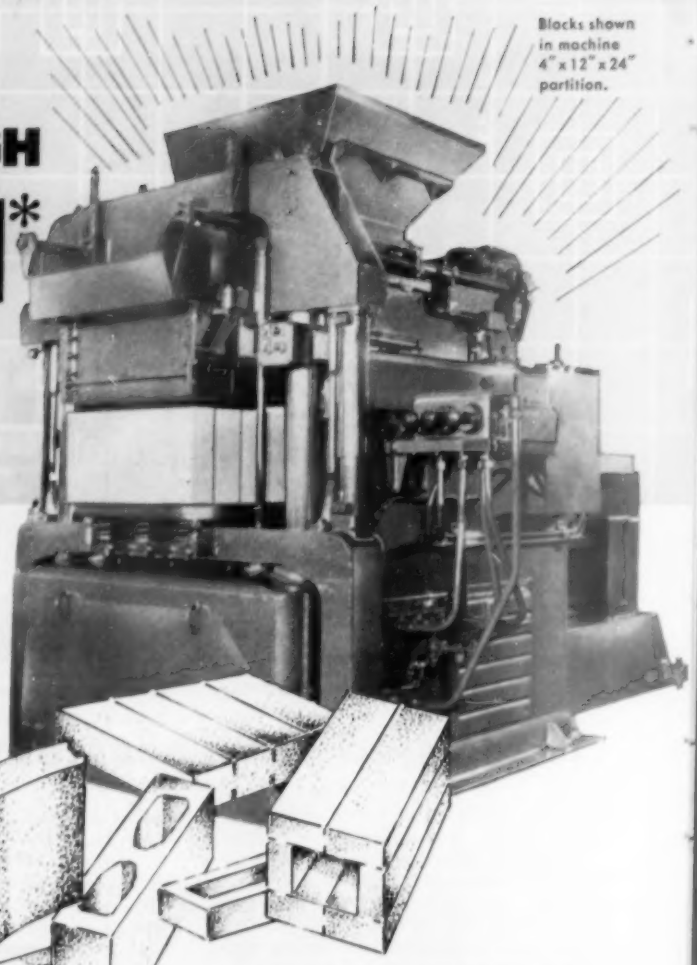
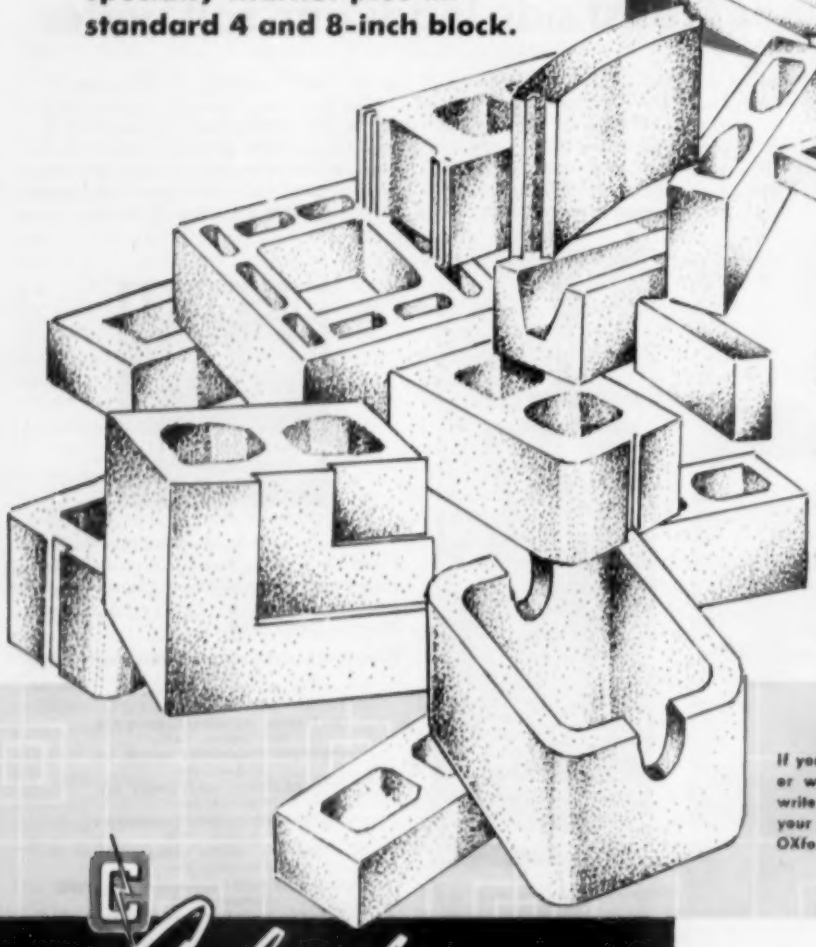


Blocks shown in machine 4" x 12" x 24" partition.

***Industry's first machine to successfully produce the popular 12-inch high shapes of today's expanding specialty market plus all standard 4 and 8-inch block.**



Here are the advanced features built into Columbia's revolutionary 12"-High:

- Electronic controls, hydraulic operation.
- Makes high-quality blocks as fast—or faster—than many machines costing three times as much.
- Superfast agitation, insuring uniform aggregate delivery to molds.
- Rugged, compact construction, requiring minimum floor space.
- All 12"-High Machines can be equipped to take 18½ x 26-inch pallets, as well as standard plain 18 x 20-inch pallets. Your present racks and pallets can be used on a Columbia 12"-High.

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NEW MACHINERY

Concrete Carrier

OSHKOSH MOTOR TRUCK, INC., Oshkosh, Wis., announces Model 18-34 6 x 6, an all-wheel drive carrier designed to carry mixers of 5½ cu. yd. and more capacity. The new model provides weight distribution of 18,000 lb. on the front axle and 34,000 lb. on the rear axle. Power steering is standard equipment. Short wheel base assures maneuverability, and power on all three driving axles provides 6-wheel drive traction for on- and off-highway hauling. Other features are: engine cantilevered forward of the front axle to permit easier servicing of the engine and Vickers power steer; front shock absorbers and 10 speeds forward to meet all operating conditions.

Enter 325 on Reader Card

Materials Handling Vehicles

YALE AND TOWNE MANUFACTURING CO., Philadelphia, Penn., is producing a new line of Yale fork trucks, including gasoline, LP gas, diesel and electric powered models. Features of the standard models are fully automatic torque converter transmission, self-adjusting brakes, power steering, and high travel lifting speeds. Controls are located for right-hand operation directly beside the operator, leaving the left hand free for steering. Forward or reverse travel motion is obtained by operating a switch located on the steering column. "Open vision" is provided the operator by lower, off-center positioning of the adjustable seat, reduced cowl height, and newly designed uprights which conceal the hose take-up. A safety feature is the anticavitation unloading valve to prevent formation of a void which would cause loss of positive channel control, and flow regulator valve for smooth lowering control without excessive speed. All Yale trucks are engineered to accommodate a full line of interchangeable attachments which are operated by Yale's single lever, push-button control.

Enter 326 on Reader Card

Metal Bonder

AA WIRE PRODUCTS CO., Chicago, Ill., has developed "Econo-Lok," a reinforcement for masonry wall construction which permits the elimination of headers. Econo-Lok reinforces the backing as it ties the facing to the backing. Advantages claimed are a uniform distribution of stresses. Econo-Lok is produced for various wall thicknesses and is available in various finishes.

Enter 327 on Reader Card

Alloy Molds

R. L. SPILLMAN CO., Columbus, Ohio, has introduced a mold of aluminum alloy for producing concrete highway dividers. The dividers are 293/8-in. x 12¼ x 4⅜-in. Pins are included to produce the holes for securing the dividers.

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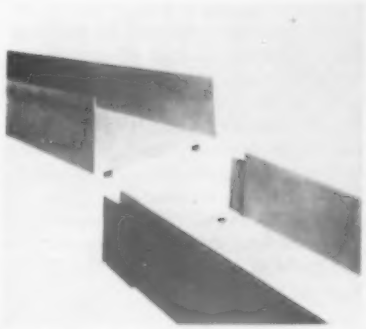

Sectional Chute

CINCINNATI METALCRAFTS, INC., Cincinnati, Ohio, has introduced a concrete chute in sections for coupling together when more than 10 ft. are required. Two or more sections may be coupled together by means of two stationary pins and two ordinary nails. Each 10-ft. x 14-in. by 7-in. section will support a full load of concrete and can be handled by one man. Made of 10 gauge steel, the chute sections have square corners to permit ease of cleaning with a shovel. They are sized to permit sliding of a section through 2- x 4-in. studding placed on 16-in. centers. Primary advantage claimed for the chute is a saving effected in pouring-time, since the entire footing can be poured without moving the ready mixed concrete truck.

Enter 329 on Reader Card

Concrete Forming Machine

W. E. DUNN MANUFACTURING CO., Holland, Mich., has brought out the Dunbeam machine for the continuous forming of concrete structural units. In the illustration the machine is producing (at a pallet speed of 6 f. p. m.) concrete lintels, but it can be adapted to turn out cored slabs, flat slabs, I-beams, T-beams, coping, and many kinds of rectangular members. Units up to 24-in. wide are produced singly or in multiples according to their sizes.

(Continued on page 224)

Maximum height is 8-in.

The principle employed by the Dunbeam machine is that of continuous forming, with the unit being given shape by the assembly contained within the machine, and densely compacted by vibration, directional rotary tamping, and mechanical troweling. Raw material, discharged from the hopper onto pallets, is shaped and densified into the finished product in the space of a few feet.

Enter 330 on Reader Card

Dragline Trucks

THE HOWE SCALE CO., Materials Handling Division, Rutland, Vt., has brought out a new line of lightweight dragline trucks. Features are all-welded steel framework, replaceable hardwood deck and roller bearing wheels. Platform sizes and load carrying capacities can vary with requirements. Optional features are sealed bearing wheels (steel, plastic, or rubber-tired).

Enter 331 on Reader Card

Nylon-Filled Belt Fabric

B. F. GOODRICH INDUSTRIAL PRODUCTS CO., Akron, Ohio, has added a new nylon-filled fabric to its line of conveyor and elevator belt fabrics. Called "Nyfil 120-RS," the fabric is a combination of super strength rayon with nylon filler which permits belt operating tensions up to 200-p.s.i. per ply width. The company states that a belt made with five plies of the new fabric is as strong as steel cord belt rated at 1000-p.s.i. per ply. Nyfil belts are available for all industrial uses, both light and high tension. Exceptional flexibility and resistance to impact are said to be features of the new line, plus greater crosswise strength and improved base for holding mechanical fasteners.

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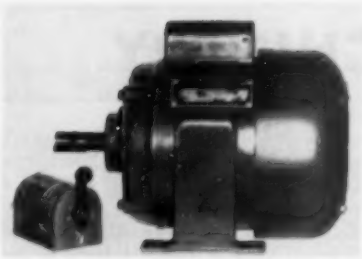

Masonry Saw Motor

CLIPPER MANUFACTURING CO., Kansas City, Mo., announces that all Clipper Super Model Masonry Saws are powered by a new 2-hp. continuous duty, fan-cooled, totally enclosed motors. Specially designed for masonry cutting, the motor is lightweight for easy portability. It is controlled by a dual voltage switch which allows for instant changing from 115 to 230 volts with no down-time for rewiring. Super Saw motors are available in 220/440 V., 60-cycle, 3-phase, or 115/230 V., 60-cycle, single-phase.

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Mobile Hoist Swivel Base

CAMPBELL EQUIPMENT CO., Chicago, Ill., has announced a new swivel base Trail-Erector for use with the Lad-E-Vator mobile hoist. The unit can swing in a complete circle, and locks when the hoist is properly positioned to dump materials at working level. The new model is used with a curved top Lad-E-Vator, and a scoop, or skip platform to dump materials at any level up to 80 ft. When the unit gets to a job, the swivel base is released, swung to position and locked, leveling legs are dropped, and the motor pulls the Lad-E-Vator up to proper level. When the unit is to be moved, the tower is lowered, locked into place, and swivelled around to traveling position. The tower is then tilted down to leave clearance for the towing vehicle. The swivel base is then fastened. The Trail-Erector rides on two 6.40 x 15 tires. Total weight of the hoist and base is reported to be under a ton.

Enter 334 on Reader Card

Block Splitter

PRECISION MACHINE WORKS, Oklahoma City, Okla., announces the "Equi-Split," a block splitter designed to eliminate breakage in splitting colored concrete block. The machine derives its name from its system of self-equalizing blade pressure on the full surface of the block. Both upper and lower jaws have four segregated blades. Three equalizer-adjustment pressure stabilizers for each set allow equal blade pressure to conform to block shape, regardless of irregularities. The unit weighs approximately 1000 lb. and makes precision splits at sizes from 1⅝-in. to 8 in. The standard size machine is built to split 16½-in. block. Machines for any size, up to 26-in. block, are available, as are feeder attachments and portable equipment.

Enter 335 on Reader Card

Cable Grip Remover

PRESTRESSED ACCESSORY MANUFACTURING CO., Iowa Falls, Iowa, has announced the Pamco lever-operated press for removal of cable grips from prestress cable. It is said to permit removal of 360 grips per hour, and is operable by one man.

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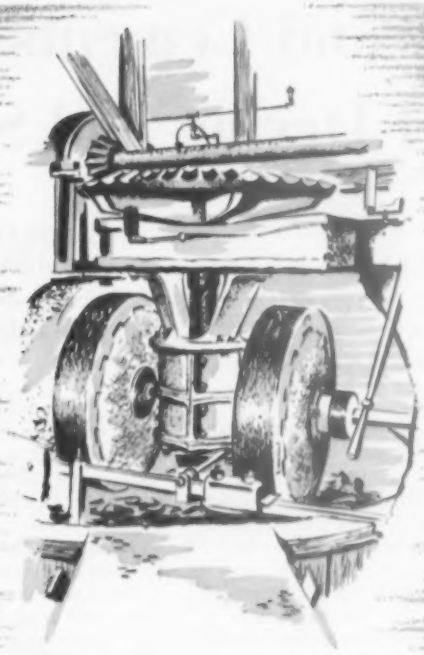
And Still
Going Strong . . .



A pair of American 9-foot dry pan grinders have been working day in and day out . . . year in and year out . . . for Whiteselle Brick & Lumber Company at Corsicana, Texas, since shortly after the turn of the century. Company officials estimate that these grand old troopers have ground material for more than 450 million brick so far . . . and both seem to have years of useful service left in them.

Today . . . as 50 years ago when they were new . . . they are handling nine yards of shale and clay per hour, working 9 hours a day and five days a week.

"The service record of these grinders does the talking for American Clay machinery," said a company spokesman. "All we've had to replace have been the grinding tires and muller and screen plates."

In the American files are many similar case studies.

This same rugged construction and dependability is built into American grinders of today . . . plus modern design that means increased efficiency and bigger volume production. American offers a complete line of eight grinders ranging in capacity from 15 to 80 tons per hour. You owe it to yourself to get all the facts on American grinders before you buy. For a profitable consulation without obligation. . .

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American CLAY MACHINERY

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Sands and Cements Affect Drying and Shrinkage Cracks

LABORATORY

. . . studies made by Pacific Coast Aggregates, Inc., show that a mixture of certain dune sands with regular concrete sand reduces concrete cracking

By E. L. HOWARD* AND JAMES IDA*

WARM DRY WEATHER EACH YEAR brings complaints of cracks in concrete slabs. The great increase in tilt-up construction has added to the yardage of concrete placed in slabs, thereby magnifying the cracking problem.

Quite by accident it was discovered that cracking was reduced when a certain dune sand was added to the regular concrete sand at the batch plant.

The following laboratory study is an attempt to confirm the effect of sands in cracking as observed in the field.

Each of ten sands used in ready-mixed concrete plants in Northern California was made into mortars. The State of California test method was used except the standard grading was not made. In this test method the cement-sand ratio by solid volume is constant and the water is varied to produce the standard consistency.

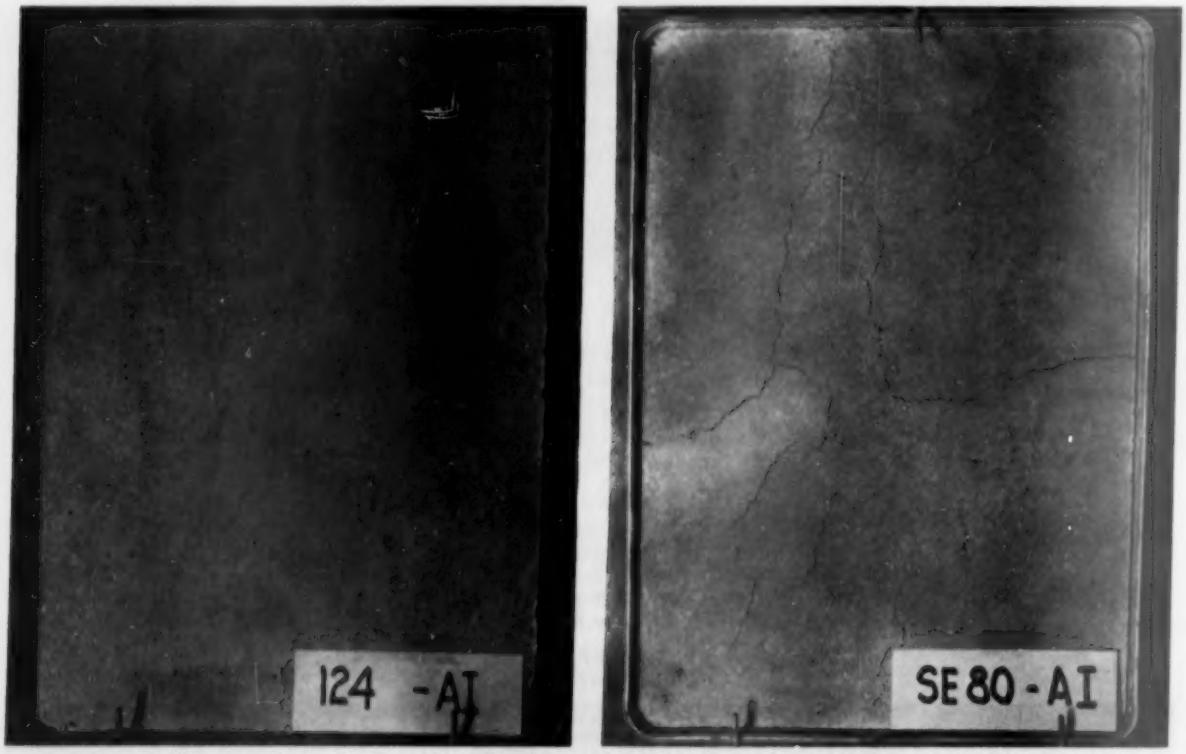
From each sand mortar batch, specimens were made for compression tests and small panels. The compression tests were made at seven days and are reported as percent of standard Ottawa sand mortars. One group of specimens was cured in water at 70 deg. F. and another group was cured at 110 deg. F. in air at 30-40 percent humidity.

The panels simulated the top surface of a slab after the jitterbug has been used and before finishing is completed. Panels were 9-in. wide by 14-in. long by ¼-in. thick. Several exploratory batches were made to develop the technique that did yield reproducible results. From each sand mortar two panels were made: one was placed in the moist closet; one, in a warm flow of air. The air over this latter panel remained 110 deg. F. until end of test, about three hours.

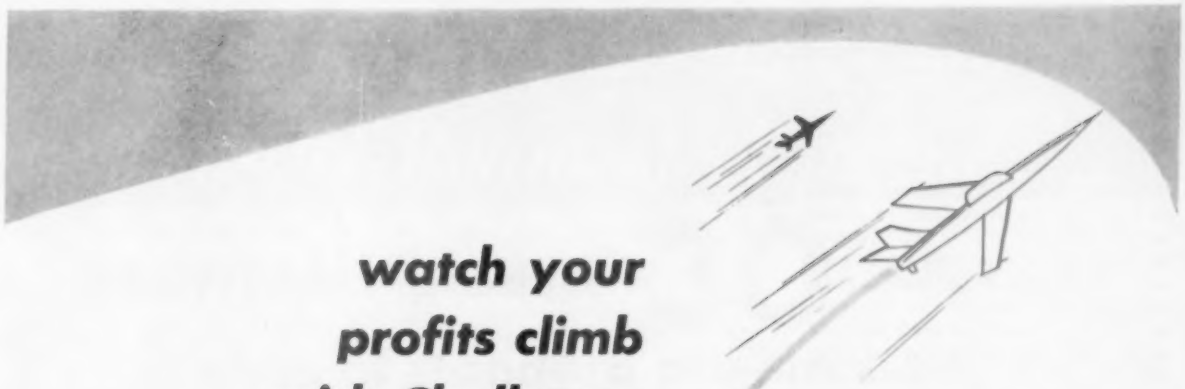
Sands, taken from regular production sources, are typical of material used in Northern California.

Compression tests and panels were made using each of the ten sands and Brand AI cement. Sands No. 733 and No. 753 were combined with each of five cements to make only panels. The

*Pacific Coast Aggregates, Inc., San Francisco, Calif.



Crack pattern of mortars subjected to warm air curing. Mortars are identical except for source of sand. (124-AI and SE80-AI)



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test data on these cements are shown in tables II and III. All of the cements were taken from loads delivered to ready-mixed concrete plants and are assumed to be typical of the cements generally used in this area.

The comparative compressive strengths of sand mortars are shown in Fig. A as the percentages of standard Ottawa sand #751. The strengths of moist cured specimens are in general agreement with the water-cement ratio for each mortar. The difference or loss of strength between dry and moist cured specimens was far from uniform for the sands tested. The pursuit of the reason for these differences led directly to the cracking problem.

The percentage of loss appeared to be related to the loss of moisture from the mortar. Figure B compares the strength loss to the crack pattern of each sand mortar. Those mortars with low strength loss of dry cured specimens had the fewer cracks in the dry panels.

Sands with a high Sand Equivalent have no particular advantage in these tests. The four best panels include sands with highest and lowest SE values. These same good panels include those sands with the greater and the least percentages passing 200 mesh.

A characteristic of the sand, not identified by these tests, affects the drying rate of the mortar and thus the cracking pattern and loss of strength. Additional panels were made with Brand AI and sand No. 753 blended with a minus 30-mesh sand, a material commonly added to coarse concrete sands in this area. The addition of 15 percent of the blending sand reduced the crack pattern from E (Figure B) to the B type pattern. Sand No. 745 (FM 2.73, cracking pattern B) and sand No. 753 (FM 3.03, cracking pattern E) have been combined to produce a sand with an FM of 2.82. Experience on concrete jobs to date with this combination has been good with none of the usual complaints about cracking of slabs.

The data in Table IV details the crack pattern results of mortars made using each of five cements and two sands. (See Table IV, page 232)

Table I
Analysis of Concrete Sands

Sample No.	733	742	745	746	776	777	753	754	755	756
% Passing U.S. Sieves										
4	93	100	100	100	94	98	99	98	96	100
8	81	87	97	98	80	76	87	79	74	82
16	65	63	68	69	70	56	59	58	54	56
30	37	39	28	39	51	40	34	38	35	34
50	14	20	18	18	22	19	14	12	15	11
100	3	8	4	4	5	4	4	5	4	2
200	1	5	1	—	2	1	1.5	1.5	3	0.5
FM	3.07	2.82	2.75	2.73	2.78	3.07	3.03	3.10	3.22	3.15
Specific Gravity	2.68	2.73	2.63	2.63	2.73	2.66	2.70	2.68	2.68	2.68
% Absorption	0.48	0.70	0.08	0.08	0.91	1.10	0.42	0.77	0.69	1.2
Sand Equivalent	90	60	96	98	87	83	85	84	74	89

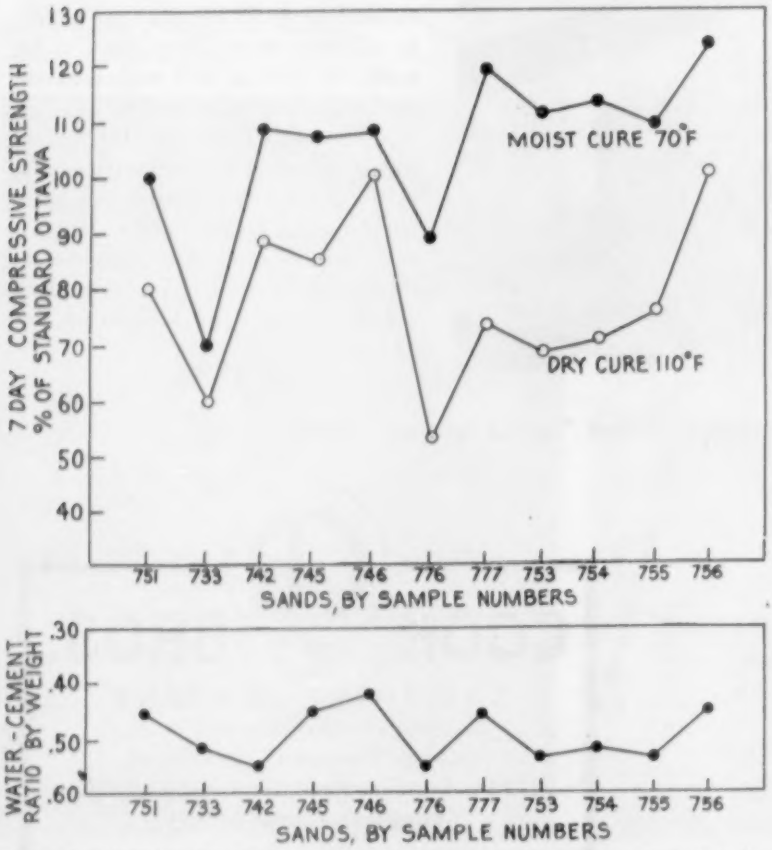
Table II
Analysis of Cements—Chemical Tests

Cement	A-I	C-I	E-I	O-I	J-I
SiO_2	21.26	24.06	23.38	21.14	21.34
Fe_2O_3	3.69	2.93	2.50	3.04	2.96
Al_2O_3	6.03	2.81	3.98	5.26	5.76
CaO	62.80	65.70	64.80	63.90	64.10
MgO	2.44	0.95	1.73	1.57	1.81
SO_3	2.21	1.95	1.78	2.81	2.10
Loss	1.12	0.90	1.02	1.05	1.26
Insoluble	0.14	0.16	0.19	0.21	0.27
K_2O	0.76	0.12	0.21	0.08	0.54
Na_2O	0.57	0.09	0.28	1.01	0.35
Total as Na_2O	1.07	0.16	0.42	1.06	0.71
C_3S	43.0	56.0	51.0	52.0	50.0
C_2S	28.0	27.0	29.0	22.0	24.0
C_3A	11.4	2.5	6.3	8.8	10.3
C_4AF_4	8.2	8.9	7.6	9.2	9.0
$CaSO_4$	3.8	3.3	3.0	4.8	3.6

Table III
Analysis of Cements—Physical Tests

Cement	A-I	C-I	E-I	O-I	J-I
Normal Consistency	24.0%	22.0	24.0	26.5	24.5
Setting Time Initial	2:30	5:35	2:50	2:20	3:55
Setting Time Final	4:00	7:30	4:30	4:50	5:50
Fineness 200 M	97.5%	97.1	92.7	96.9	93.4
Wagner Surface	1785	1947	1575	1923	1627

(Continue table on page 232)



Concrete subjected to test used Pacific Coast Aggregate sands and A-1 cement (Fig. A)

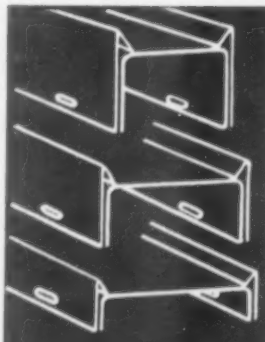
Cracking Pattern

Each cement has its own crack pattern. Thus, to the variances apparently caused by sand, others inherent to the cement can be added. Only CI cement reverses the position of the two sands. In each of three panels, made to check this "out of order" result, the 753

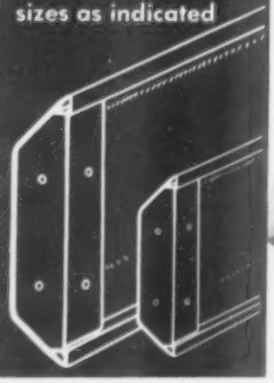
(Continued on page 232)

Invest in only 4 sets of basic FORM-CRETE *I-Beam steel forms . . .*

PROFITABLY produce 30 different sizes of standard pre-stressed concrete I-Beams . . .



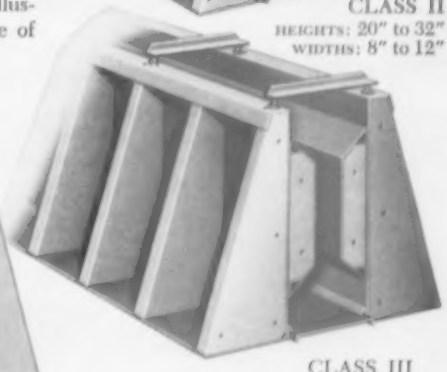
Interchangeable pilot liners and material displacement inserts are fabricated for each Class to produce all product sizes as indicated



Side forms, inserts and pilot liners in all four classes are fabricated in 10-foot lengths for most efficient casting operations. Specially designed tie bar assemblies (adjustable to two or three casting positions for required widths) hold top of forms firmly in place for accurate casting. Bottoms of forms and pilot liners are locked in position by specially designed Panel lock bars and wedges to provide uniformly smooth pre-stressed I-beams that will meet the most rigid specifications. Prefabricated pre-stressed concrete construction is sweeping the country because of lowered construction costs when used. Architects everywhere are specifying it. Get into this lucrative market now – send for our descriptive, fully illustrated bulletin showing the complete line of Form-crete steel forms – write today!

CLASS I
HEIGHTS: 12" to 20"
WIDTHS: 6" to 10"

CLASS II
HEIGHTS: 20" to 32"
WIDTHS: 8" to 12"



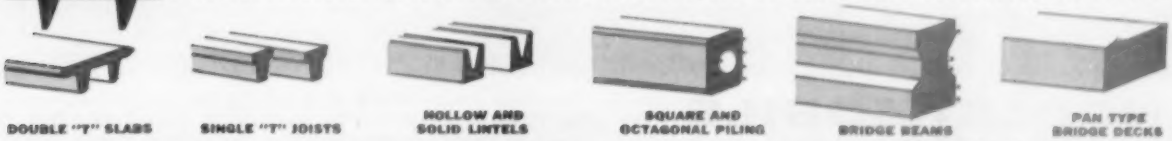
CLASS III
HEIGHTS: 36" to 48"
WIDTHS: 14" to 18"

CLASS IV
HEIGHTS: 52" to 64"
WIDTHS: 20" to 24"

SEND FOR **FORM-CRETE BULLETIN 200** PF-6

FOOD MACHINERY
AND CHEMICAL CORPORATION
FLORIDA DIVISION
LAKELAND, FLORIDA

FORM-CRETE STEEL FORMS FOR CASTING REINFORCED OR PRESTRESSED CONCRETE



DOUBLE "T" SLABS | SINGLE "T" JOISTS | HOLLOW AND SOLID LINTELS | SQUARE AND OCTAGONAL PILING | BRIDGE BEAMS | PAN TYPE BRIDGE DECKS

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How job site batching with supplier $920,000 contract of 5 stationary plants

On the southern outskirts of San Francisco above San Bruno is a 5000 acre hillside area of new subdivision and shopping center construction. 6 ready-mix suppliers were in position to bid on the contracts: 5 stationary plant operators and Cupertino Concrete Co., the one Noble-Mobile batching plant on wheels operator. Cupertino was able to take the job at a price 8% below the nearest competitor yet make a profit averaging 6%. By driving his Noble-Mobile to the job site and producing there, Cupertino reduced transit truck hauls to a maximum of 2 miles and saved over 50% on hauling costs. Each Cupertino transit truck works an average of 6 hours a day making up to 12 trips of 5 yards per trip, totaling 60 yards of concrete per day per truck. 60 yards supplied from the nearest competitive stationary plant would have required 2 to 3 trucks. Cupertino saves up to 8 transit trucks.

When the job started in August, 1954, Cupertino located the Noble-Mobile in the center of the first project so the maximum haul would be only 1 mile. On completion of that project and the beginning of another project 1.5 miles distant, Cupertino closed shop on a Friday night and by the following Monday morning had dismantled, moved and reassembled the Noble-Mobile in the new location and was delivering concrete. The cost of setting up the Noble-Mobile in the new location was a mere fraction of what it would have been to install a stationary plant. Saved were the weeks and even months wasted in cutting through legal red tape to secure permits and complete construction. A further source of profit is the do-it-yourself residents of the newly completed homes.

Batching plant on wheels driven to the job site saves erection costs, taxes, site availability problems. Purchase is easier to finance than stationary plants. Pays for itself in savings from shorter hauls. Saves outlay for extra transit trucks and cost of depreciation. Many producers maintain one or more Noble-Mobiles in reserve to handle sudden surges of business and to discourage competitors from stepping in.

Pouring site on 16 per cent grade 1.9 miles below Noble-Mobile plant. Arrow points to closest stationary plant 3.4 miles distant. Noble-Mobile was stationed above construction area so all hauls would be downhill. Competitors had to compute costs on slow, ponderous up-hill drags.

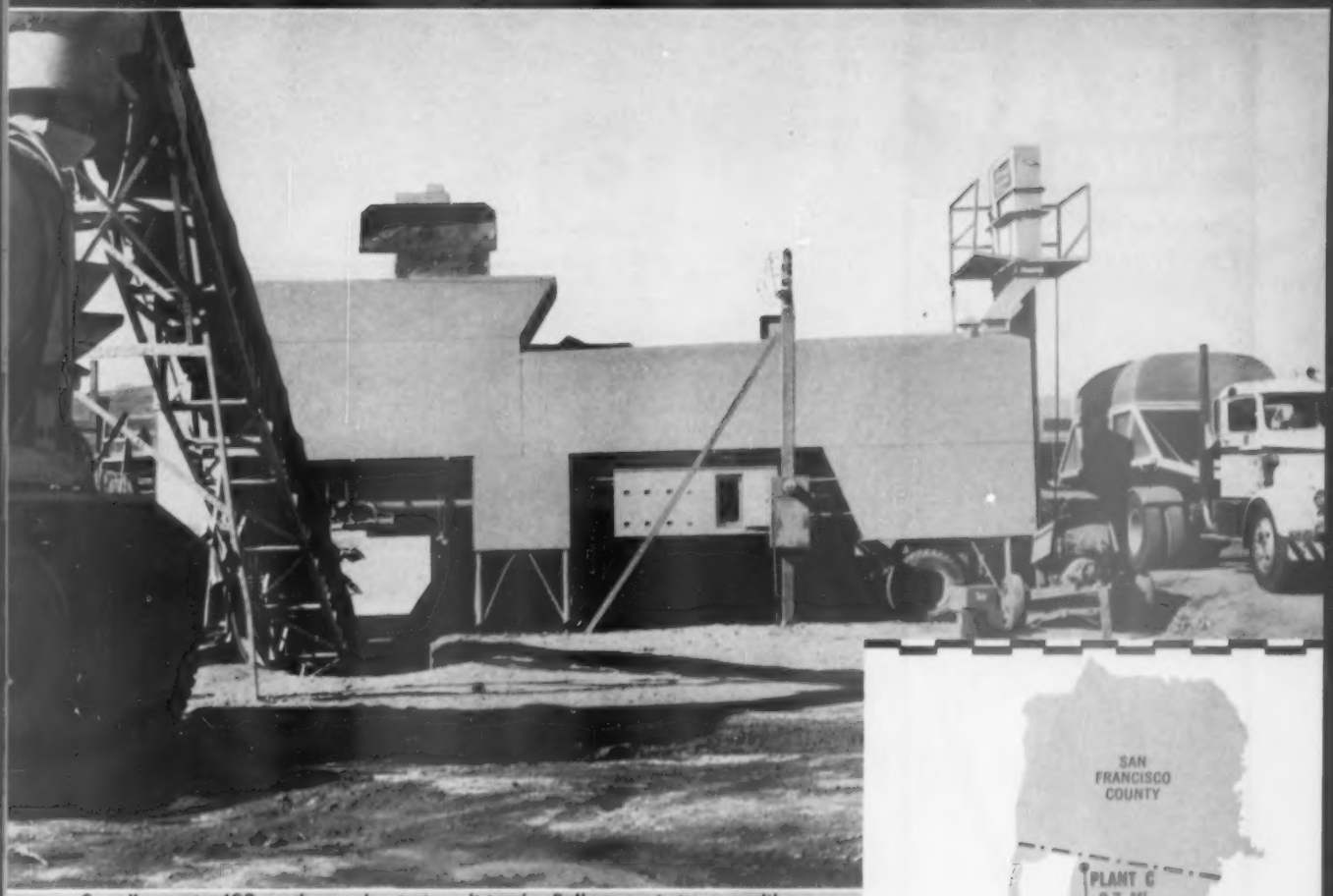
Concrete for 10,000 homes in a 10 year building program! $35,000 Noble-Mobile batching plant, located 2 miles above, supplies concrete for foundations, sidewalks, retaining walls, driveways, patios.

NOBLE-MOBILE Batchmobile
Covered by patents pending

WRITE FOR CIRCULAR

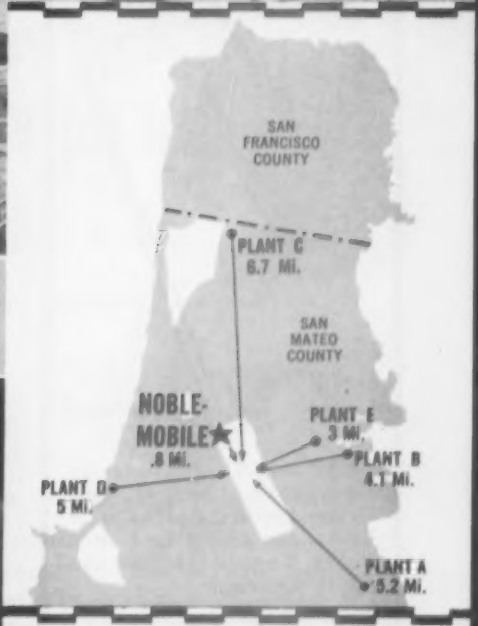
THE NOBLE COMPANY • 1860-7TH ST., OAKLAND 20, CALIF. • TEMPLEBAR 2-5785
Branches: 20950 Center Ridge Road, Cleveland 16, Ohio. EDison 1-3426
518 First Ave. North, Seattle, Wash. MUtual 4878
218 Richmond St., El Segundo (Los Angeles), Calif. EAstgate 2-4518
International Sales Agent: Frazer International Corp., San Francisco

NOBLE-MOBILE got at 6% profit against bids



Supplies up to 400 yards per day to transit trucks. Bulk cement storage with truck hopper unloading screw and elevator. Weighs aggregates and cement separately and simultaneously. Automatic or semi-automatic control. Set up in 1 day. No field wiring, concrete foundations or crane time required on base plant.

Fed by scooploader from aggregate and sand piles. Cost to haul aggregates, sand and cement from producing site to Noble-Mobile no more than to haul to general area where competitors' stationary plants are located. Plant may also be fed by conveyor or crane.



Map of construction areas south of San Francisco showing Noble-Mobile site and competitors' stationary plants — A, B, C, D, E. Note the .8 mile haul from the Noble-Mobile compared with the up to 6.7 mile hauls from the others. "Economics of job-site batching are so sound no outside stationary plant can compete," reports Bob Soldini, Cupertino Concrete Company.

DISTRIBUTORS: BIRMINGHAM, ALA., Equipment Service Co. • PHOENIX, ARIZ., Superior Equipment Co. • VANCOUVER, B. C., Westcoast Equipment Co., Ltd. • DENVER, COLO., Western Machinery Co. • BALTIMORE, MD., General Supply & Equipment Co., Inc. • CEDAR RAPIDS, IOWA, James W. Bell Co. • INDIANAPOLIS, IND., Manwaring Machinery Co. • DETROIT, MICH., R. G. Moeller Co. • ST. PAUL, MINN., Borchert-Ingersoll, Inc. • CLEVELAND, OHIO, Waco Equipment Co. • LOS ANGELES, CALIF., Smith-Booth-Usher Co. • PORTLAND, ORE., Clyde Equipment Co. • PHILADELPHIA, PA., Furnival Machinery Co. • PITTSBURGH, PA., Equipment & Supplies, Inc. • AMARILLO, TEXAS, Plains Machinery Co. • DALLAS, TEXAS, North Texas Equipment and Supply Co. • HOUSTON, TEXAS, Boetch Engineering Co. • EL PASO, TEXAS, Border Machinery Co. • WACO, TEXAS, Richards Equipment Co. • SAN ANTONIO, TEXAS, Contractors Machinery Co. • SALT LAKE CITY, UTAH, Arnold Machinery Co. • SEATTLE, WASH., Star Machinery Co. • SPOKANE, WASH., Intermountain Equipment Co. • CASPER, WYOMING, Studer Tractor & Equipment Co. • MONTREAL, QUE., Laurentide Equipment Co., Ltd. • WINNIPEG, MAN., Huggard Equipment Co., Ltd. • BOSTON, MASS., Hedge & Matthais Co. • LOUISVILLE, KY., Emmett C. Watson Co. • NASHVILLE, TENN., Paterson Machinery Co.

For the BEST in concrete construction

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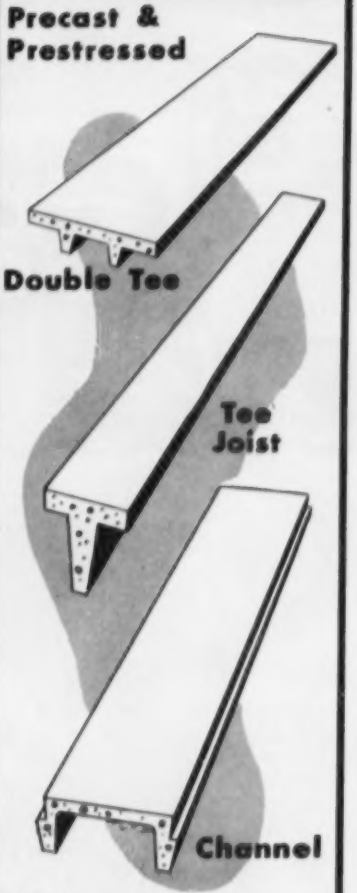
Precast & Prestressed



LEAP concrete products are mass produced in long spans to standardized designs in 25 plants throughout the United States, Canada, Hawaii and South America.

Franchises available in some localities—write for complete details.

See our listing in Sweet's Architectural file.

LEAP CONCRETE
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Please send me complete details about LEAP *Prestressed* Concrete.

NAME .....
ADDRESS .....
CITY .....
STATE .....

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Table III—continued from page 228

Autoclave Expansion	0.17	0.02	0.04	0.10	0.11
Compression test					
Days 3	2225 p.s.i.	1797	1650	1922	2088
Days 7	3171	2806	2646	2697	3491
Days 28	4207	4244	4231	3686	4747
W/C	.50	.49	.52	.53	.52
Flow	102	111	103	109	108
False Set			0 mm.	3 mm.	2½ mm. at
ASTM	None	None	8 min.	5-8-11 min.	8-11 min.
C-359-55			yes	yes	yes
Entrained Air %	8.4	9.6	4.1	7.9	5.0

Table IV
Comparative Crack Pattern of Several Mortars

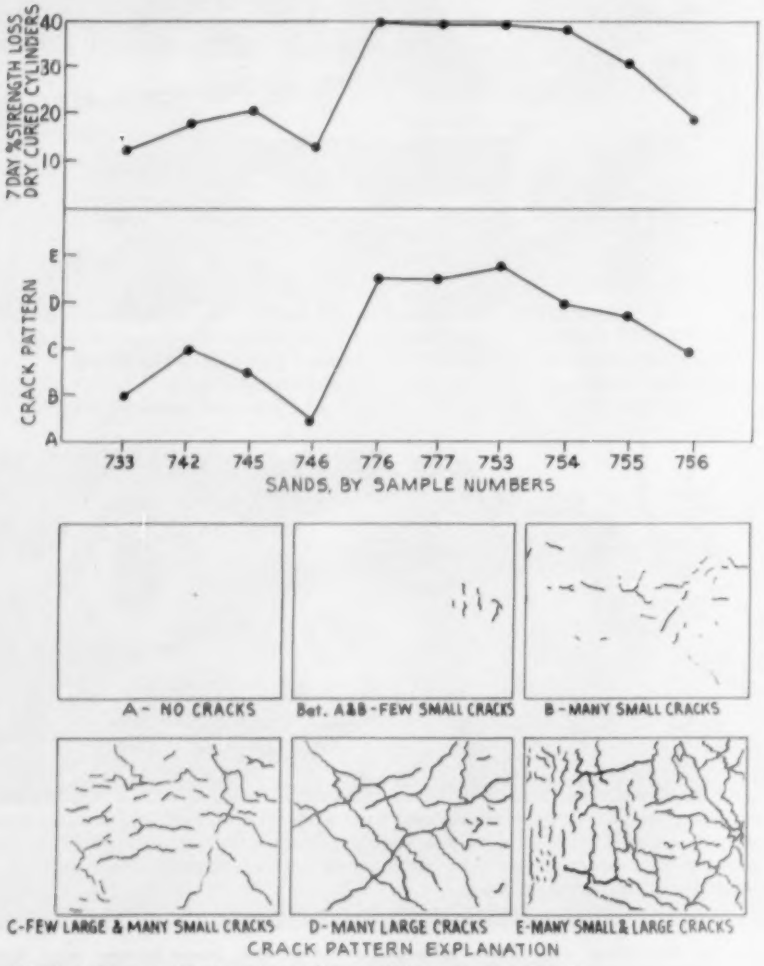
Cement	AI	CI	EI	JI	OI
Sand 733	B+	C	C	B	C
Sand 753	E	B	E	B+	D

sand made the better panel with CI cement.

Case histories from job files confirm the tendency for concrete containing certain cement-sand combinations to crack more than others. The cracks are troublesome on those days and locations that drying out of the slab takes place.

All panels made in this study and placed in the moist closet did not show cracks at any time. Those mortars subjected to the warm air had cracking tendencies in proportion to the loss of moisture.

This study did not include the rate of moisture loss nor a method for testing the characteristic of cement and sand that causes the water to stay in or leave the mortar.



Crack pattern explanation of six different slabs under test, Fig. B.

GOFF KIRBY READY MIX COMPANY DISPATCHES TRUCKS BY RADIO, SAVES MONEY ON HAULING

Cleveland, Ohio Firm Operates 70 Trucks From Four Plants—Finds General Electric 2-Way Radio Helps Keep Costs Down!

Goff Kirby is one of Ohio's largest ready mix concrete firms. Its rolling stock is a familiar sight on construction projects throughout the Cleveland area. Last year, Goff Kirby Ready Mix Company was the only outside concrete supplier to deliver ready mix to the Ohio Turnpike project.

32 Trucks Have G-E Radio!

Nearly half the company's fleet is G-E radio equipped. These drivers are in constant contact with each of the four GK plants. Dispatch orders, changes, and special instructions by radio help make sure that loads get to a job on schedule. When breakdowns occur, the GK repair vehicle is on the scene in record time.

Radio Helps Keep Hauling Costs Down!

Edwin Harper, Goff Kirby president, reports that most of the cost of concrete is in the hauling charges. Typical rental of a concrete truck in his city is $11.50 per hour. By eliminating truck waiting time and driver overtime you save money. General Electric 2-way radio helps keep these costs down.

2-WAY MOBILE RADIO

Radio Can Help Your Operation, Too!

Goff Kirby is a typical example of progressive management in the concrete business. Your G-E Communications Counselor can tell you of others, show you how G-E Progress Line Radio can save you money. Call him in, or, write: *General Electric Company, Communication Equipment, Section X45106, Electronics Park, Syracuse, New York.*

Progress Is Our Most Important Product

GENERAL ELECTRIC

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Merchandising
Ready-Mixed Concrete

By JAS. A. NICHOLSON*

45: A producer views the ready-mixed concrete business. This is the second article on merchandising

TO DEVELOP AN EXPANDING VOLUME OF PROFITABLE BUSINESS, all employees of a ready-mixed concrete company—from the general manager to the lowest seniority driver—must make a better effort on every sale and on every delivery service. There is no better way to merchandise concrete than making certain that you are producing a better concrete, delivering it better, and selling it better. A better job also has to be done on order-taking, dispatching, supervision, cost control, preventive maintenance, safety, billing, credit handling, and general administration if the merchandising program is to be based on a solid foundation.

The big part of most producers' volume goes to the contractor trade. Except in farm markets, consumer business is quite limited. It is doubtful that contractors generally are sold by any of the regular advertising media. Contractors are sold by quality, service, and price. They are sold by personal calls and telephone calls. They are sold when their superintendents, concrete foremen, and other job employes speak highly of a producer, his company, its product, its service, and its field representatives. Contractors are sold when concrete of the right strength, slump, and air content arrives on time at jobs; when alert drivers step out of fine appearing trucks and give job employees full cooperation in getting truck mixers unloaded as efficiently and promptly as possible. They are sold by prompt and accurate billing, proper handling of complaints, and by every effort on the part of a producer and his employes in showing customers that their business is sincerely appreciated.

Hiring Salesmen

At this time, we are primarily concerned with actual selling efforts, including work of salesmen, the use of promotional aids, and the development of an advertising program.

The first step in making certain that our sales employees will be successful is to take great care in screening applicants for the jobs of sales representatives or service engineers.

In our industry, what qualities are we looking for as we select men to be salesmen or service engineers? We certainly are seeking aggressiveness, alertness, and loyalty. A young man who has these qualities, coupled with an engineering background, would seem to be an ideal prospect. While a technical background is not an absolute requisite for selling success in our field, knowledge of concrete fundamentals and concrete construction is required. A new man must either know concrete or acquire sufficient knowledge.

We should take personal appearance and behavior indications into consideration. After each business call, we want the prospective customer to primarily remember that we are a dependable ready-mixed concrete company selling a quality product and hoping that he will want to do business with us. We want no personal impression of our sales or service representative to interfere with that thinking.

In selecting field representatives for our company, we try to eliminate the overdressed "fop", the know-it-all, the braggart, the late ariser, the guy who is always telling off-color stories, the "tension" individual, the drunkard, the double-talker, the careless slob, the time waster, the clock watcher, the fault finder, and the fellow who can't look you in the eye. We look for the friend maker, the quick thinker, the attentive listener, the well-mannered, the good negotiator, the hard worker, the hustler, the mixer, and the guy who is willing to work long hours.

As we screen applicants, we keep in mind the kind of representation we want in the field. We expect our salesmen to be aggressive in following up business leads; to be prompt and fair in handling complaints; to make contacts with the right persons in each contracting firm; to make proper preparation for business calls; to make business calls (not social visits); to be ready with the right answers to any anticipated questions or objections; to sell quality and service rather than price; to know when to ask for an order; to get the sale if at all possible; to find out—if they lost a sale—why they lost it; to report the situation factually to the office; to make recommendations on steps to be taken to secure future business from this prospect; to promptly check any possibility of losing a present customer; and to be constantly on the alert for any new prospects.

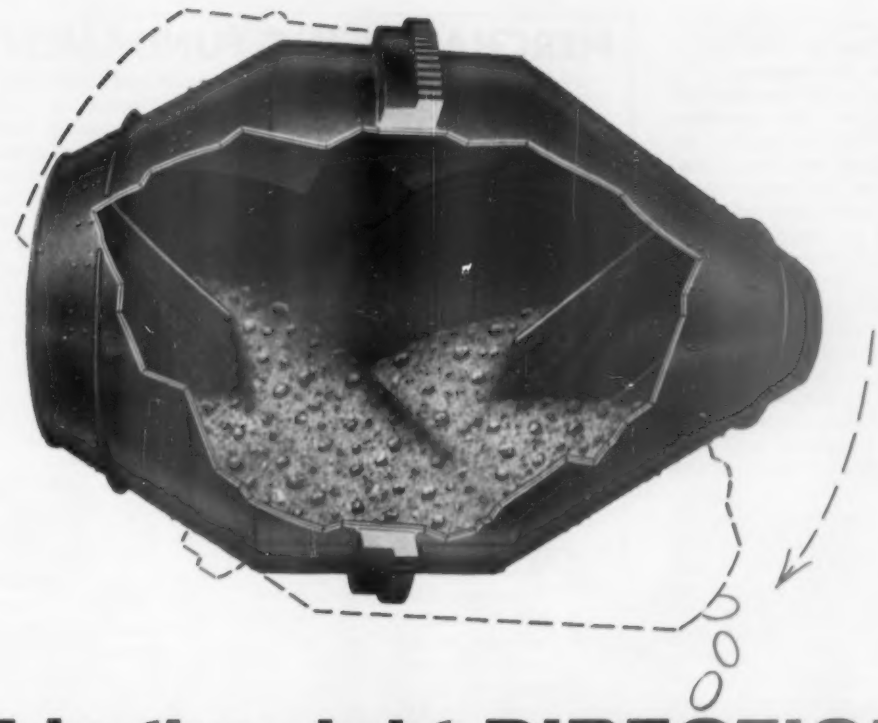
On jobs, we expect our field representatives to check that the right kind of concrete (proper strength, slump, air content, etc.) is being delivered; job is being efficiently serviced; good access to delivery points is provided; trucks are being properly protected; truck drivers are competently handling their work; contractors are efficiently unloading our truck mixers; and drivers are promptly leaving jobs to return to the plant.

We expect representatives to be alert to such important factors as faulty handling by individual drivers (including lack of cooperation) of truck and mixer equipment; service and quality complaints; bad ground conditions; poor workability of concrete; excessive unloading time; inadequate job handling of concrete by contractors in placing, finishing, or curing; any unpleasant relations between our drivers and job employees; unfavorable appearance of mixer trucks or any delivery equipment maintenance that might be required.

Proper Training Needed

Having chosen a man from the list of applicants, we make every effort to see that the sales apprentice gets a proper understanding of concrete, selling, and service fundamentals. He is given a six-weeks training period, studying operations of the mixing plant, dispatching room, and front office. In Toledo, we maintain close

*Pres., Nicholson Concrete Co., Toledo, Ohio.



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You're looking at the inside story of a Smith Tilting Mixer. *The balance* between profits and costs *tilts way up in your favor* with these world-accepted mixers because no lifting of materials is necessary. *The batch is discharged simply by tilting the drum.*

Aggregates are folded over in the bottom of the drum — are lifted to a minimum degree. Materials can NOT drop down with a smash from top to bottom of the drum. Thus the greatest cause of wear is completely eliminated.

This is not possible with any other type of mixer. Long life, low maintenance cost are the result.

These Smith Tilters with their non-lift mixing easily handle large stones and boulders so frequently specified by engineers these days. That's an important plus value for you.

SIZES: 1, 2, 3, 4, 6, and 7½ yds. Write for details.

SMITH

THE T. L. SMITH COMPANY

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Affiliated with Essick Manufacturing Co., Los Angeles, Calif.

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relations with a very fine testing laboratory. Through this arrangement, a new man is given the opportunity to learn a great deal about the practical problems of concrete. The apprentice is given industry literature to read, including even some of my own articles. He spends a week or more making trips to jobs and contractors' offices in the company of an experienced field representative. We send a new man to the Short Course on Quality Concrete conducted annually by the Ohio Ready Mixed Concrete Association. Several of our new men have attended the Short Course on Concrete sponsored by our National Ready-Mixed Concrete Association, which is held annually at the University of Maryland under the leadership of Stanton Walker and Delmar Bloem.

When we feel that the new salesman has had sufficient training, we send him out in the field to prove himself and, incidentally, to get us some new business. We provide him with a list of customers and new customer prospects. We expect him to find additional prospective customers. To give encouragement to the new man, we sweeten up his list by including a number of good accounts.

It is our policy to provide all field representatives with company-owned automobiles. Some producers make leasing arrangements for salesmen's cars. The comparative advantages of owning or leasing should be investigated. To date, all of our field representatives have been working on straight salary, as considerable time must be spent on servicing jobs. During recent months we have been meeting with our salesmen in an effort to hit upon a bonus or commission program that will provide incentive compensation.

We expect our field representatives to be good mixers. We want them to circulate as much as possible in "business getting" circles such as architect meetings, contractor affairs, local and state builders' conventions, concrete contractors' programs, cement finisher schools, and fraternal organizations.

Prepare For Business Calls

Principal criticism of your salesmen's efforts may be lack of preparation before making business calls. Too often salesmen just make calls. They don't go to accomplish something; they just pay a visit. At times they may not seem to realize that they are trying to sell your company and your products. They may know little about the man on whom they are calling. Too frequently they may not even know the name of the man whom they are to see. They haven't prepared properly for the interview that has

(Continued on page 238)

MERCHANDISING FUNDAMENTALS

1—The combination of a fair price, uniform quality, and A-1 service is a good foundation for successful merchandising.

2—When a producer's service accommodations are limited, he should stay away from paving work and all other big projects; no big job should be taken at the expense of regular customers. Rather than take a big job and offend regular customers with poor service, it might be better to share a large project with a competitor.

3—A producer with high operating costs should specialize on smaller jobs and on the smaller contractor who is willing to pay more for service.

4—Even where a producer has lower operating costs, it is a dangerous business to go after the big work alone; it is safer practice to solicit and service both large and small jobs.

5—A producer should always remember that he is not primarily interested in sales volume, but in how many sales dollars will be left at the year's end in solid net profit.

6—A producer must profitably price the concrete that he sells. In 1929 Alex Foster, Jr. advised: "the average selling price for delivered concrete should be based on twice the profit return compared with the regular delivery of concrete materials for construction work."

7—On private sales, there should be a standard market price. To get an even break on telephone sales to private individuals, a producer's selling price must be the same as his competitors'.

8—A reduced selling price should be based on volume yardage, shorter hauls, faster unloading times, lower operating costs, and more delivery trips per day. A sale below average required mark-up should only be considered when assured that the business will develop more trips (by individual trucks) per day, coupled with lower plant and delivery costs.

9—A ready mixed producer basically has three things to sell: quality, service and price. In a good market, quality and service are stressed in merchandising concrete.

10—Undercutting a competitor's price may get a particular job; however, if undercutting is a producer's principal sales weapon, sooner or later he will wind up out of business.

11—Ready mixed concrete companies are outstandingly successful when they are able to combine higher than average profit margins with lower than average costs of operation.

12—Unless the ready-mixed concrete industry supplies a better, more economical product, the contractor will again make his own concrete.

13—A producer should make good customer relations his prime consideration.

14—It takes more than a determined producer to put across a merchandising progam. All or most of his employees must be sales and service minded.

15—To develop an expanding volume of profitable business, all employees of a ready-mixed concrete company must make a better effort on every sale, on every delivery service.

16—Goodwill is the heart of successful merchandising. A producer should have a real pride in his business, employees, service, and product quality. A producer should have a great appreciation of customer importance to his business.

17—The newspaper, radio, and television are excellent mediums of advertising to increase volume of consumer business; other than personal calls, direct mail advertising seems to be the best way to reach the contractor trade.

18—The Portland Cement Association and the National Ready Mixed Concrete Association are cooperating to promote ready mixed concrete for use in city street paving. Producers everywhere should start their planning now so that they will be ready when local efforts get under way.

19—For paving construction, a producer should push the sale of ready mixed concrete; selling batched material simply undercuts the price of his own product as well as his competitors'.

20—The future of ready mixed concrete in city paving programs is dependent on our industry's ability to make on time deliveries in sufficient quantities of low priced, uniform, quality concrete.

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These three Mack model B421S concrete mixers are part of the big San Mateo Feed & Fuel Company's fleet. Macks have helped set the pace for their growing operation since 1951.

compared to all other makes in our fleet . . . MACK's performance and maintenance records were outstanding . . . that's why we bought 35 more

—R. C. Hughes, President
San Mateo Feed & Fuel Company
San Mateo, California

Proof of performance is what Mr. R. C. Hughes, president of San Mateo Feed & Fuel Company, demanded before buying 35 new Macks—21 model B421S mixers, and 14 model B30P dumpers.

"We relied on our records," commented Mr. Hughes, "when the time came to make a major decision for modernizing our fleet. The answer was clear . . . in our mixed fleet Macks were the stand-outs for fuel economy, low maintenance cost, and over-all earning capacity.

"We bought our first six Macks in 1951, and added 14 more in 1952. Now, with the addition of 35 new units, our fleet contains 55 Macks. We consider our big investment in Macks an important factor in building increased profit into our rapidly growing business."

Get the facts on Macks before you buy another truck. See your Mack Branch or Distributor and find out how Mack can give you top performance and economy in every trucking operation.

4014

MACK TRUCKS, INC., Plainfield, New Jersey. IN CANADA: Mack Trucks of Canada, Ltd.

Make New Profitable Savings With
Rinson Fork Lift Trucks'
Block Yard-to-Scaffold Delivery

LOADING a truck with block or brick is quick and easy with a Rinson Fork Lift. A Rinson goes into tight places for loads, lifts up to 15,000 pounds; spots loads quickly wherever needed on the truck. Standard Ford Truck parts mean easy maintenance.

TOW Rinson Fork Lifts at highway speeds. Built-in tow-bar drops into place; forks fold up, save 4 ft. of length. Take your Rinson anywhere. Lights, steering axle, tie-in braking system, and 4 wheels on the ground give you more speed and safety on the road and on the job.

DELIVER on the job. One man and a Rinson unload quickly. Lift carries 50 or more blocks over curbs or rough ground You elevate up to 20 ft. for stacking or scaffold work. Do hours of work in minutes. Rush a Rinson for quick yard-to-scaffold deliveries.

ENJOY new profits with a Rinson

- Lifting weights to 15,000 lbs.
- Lifting heights to 20 feet.
- Equal braking—forward & reverse.
- Standard & custom-built models.
- Priced from $3665.

WRITE TODAY FOR FREE ILLUSTRATED BROCHURE

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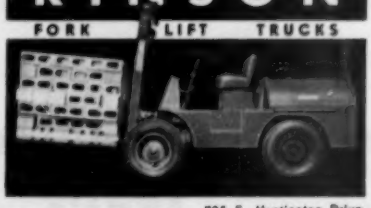

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TERRITORY FRANCHISES
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EQUIPMENT DIVISION
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Enter 1550 on Reader Card

KEEP ABREAST WITH INDUSTRY TRENDS THROUGH ROCK PRODUCTS

SELLING READY-MIX

(Continued from page 236)

been arranged. They may fail to make adequate arrangements for meetings which then fail to materialize because of this carelessness. Probably no file has been kept on the prospective customer. Too often your men may have been calling on customers completely unprepared for their important selling task.

A salesman who gets ahead in the ready mix industry knows his product; understands and approves company policies; makes proper arrangements for his business calls; spends as many hours as possible making calls; sees to it that his commitments are backed up by efficient service and quality concrete; takes every possible step to avoid losing a present customer (e.g., handles complaints promptly); uses the telephone during evening hours to extend number of business contacts; prepares reports and writes letters during spare time; studies trade publications at night and over weekends; checks newspapers for construction stories; promptly follows up all new business leads; and plans calls ahead for the next day and the following week. In the ready mix industry, as in other fields, hard work and proper planning add up to selling success.

A better informed salesman can do a better selling job. A good salesman is prepared for his sales calls. He has carefully "cased" his prospect. He knows as much as possible about his prospective customer's business, his sub-contractors, principal suppliers, his interests, strength, and weakness. He is acquainted with his customer's needs. He has planned his sales approach. He anticipates important objections and has his answers ready. If his company has "goofed" on previous concrete deliveries, he admits that the customer had justifiable complaint, stresses corrective steps that have been taken, and makes a personal commitment to see that top service will be given.

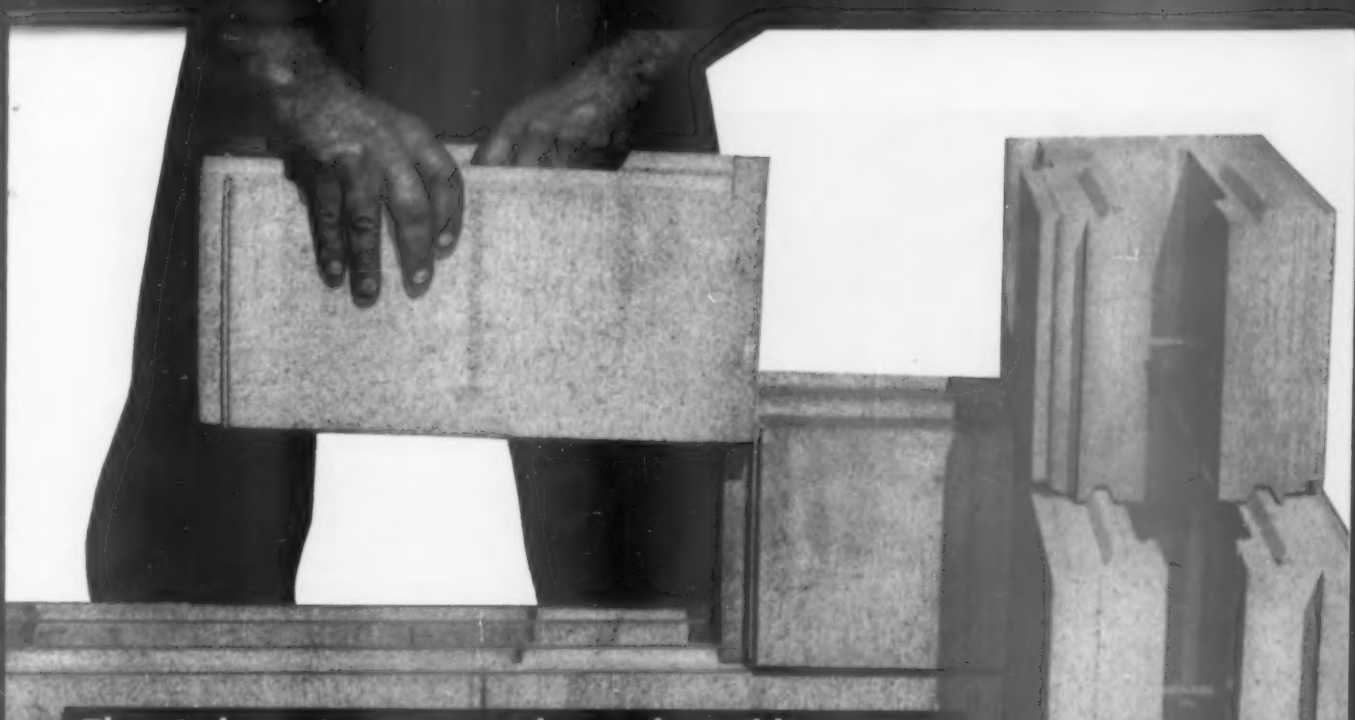
A good salesman has figured out what value primarily interests his prospective customer. It may be service, quality, uniformity of concrete, workability, durability, closeness of plant operation to job, driver performance, and it may be a low price. The successful salesman knows what it takes to get an order.

Contractor Criticisms

In a 1954 N.R.M.C.A. convention talk, G. H. Paris, Portland Cement Association, listed these contractor criticisms (in order of number of complaints) of performance by ready-

(Continued on page 240)

Enter 1551 on Reader Card



The Industry's Most Advanced Building Unit

True "Air Cavity" PRESTO BLOCK

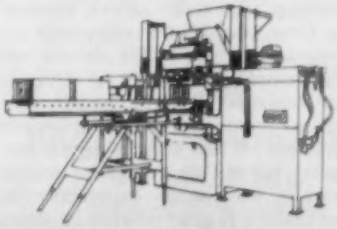
Now offers YOU these revolutionary advantages

LOW-COST, AUTOMATIC PRODUCTION of either 8-inch or 12-inch high units. Presto Blocks are manufactured on the world's most advanced hydraulically-operated, electronically-controlled concrete block machines at 4 to 6 cycles per minute . . . (depending upon the type of aggregate used.)

COMPLETE TWIN WALL INSULATION . . . WITH A SINGLE UNIT! Each Presto Block is actually a miniature twin wall in itself, comprised of two separate concrete blocks united by corrugated steel ties. Only Presto Block eliminates all masonry bond to build a true air-cavity twin wall for complete sound, temperature and moisture insulation.

ECONOMICAL, FAST, EASY ERECTION. Because Presto Blocks are keyed to lock upon erection, they build into a wall with amazing speed and ease. Since Presto Blocks require no additional reinforcing—and no mortar, except for pointing of joints—they afford an in-the-wall economy not obtainable with conventional concrete masonry.

INDUSTRY-WIDE ACCEPTANCE! Since our Presto Block announcement last month, hundreds of architects, builders and manufacturers have wired, written and talked to us by phone, requesting more information. The building industry has enthusiastically endorsed and accepted concrete masonry's most revolutionary advance . . . PRESTO BLOCK!



Precision - manufactured Presto Block Machines are manufactured by Columbia Machine under U. S. and world-wide pats. and pats. pending.

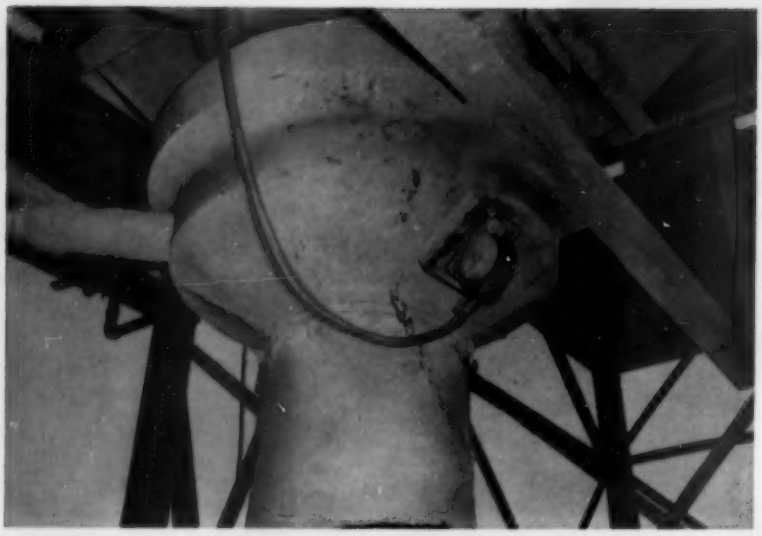
GET THE COMPLETE PRESTO BLOCK STORY and information regarding franchise arrangements, write, wire or phone today.

PRESTO BRICK MACHINE CORPORATION

Empire State Bldg., New York Pennsylvania 6—1353-4-5-6-7

© 1956 Presto Brick Machine Corp.

THE BLOCK WITH COMPLETE BUILT-IN INSULATION



Typical AiroViber vibrator installation to keep bulk materials moving.

Low Cost AiroViber Speeds Movement of Bulk Materials by Trouble-Free Vibration

Operates quietly, effectively in wide range of temperatures; requires no maintenance

TROUBLE-FREE external vibration for effective movement of bulk materials in loading, unloading, moving, packaging, processing, grading or separating is now available to you in the low cost AiroViber vibrator. Simple design of AiroViber involves only one moving part and ends necessity of down time for periodic maintenance or lubrication. It also includes a noise reducing design that eliminates annoyance of sounds often experienced in ordinary types of vibrators.

AiroViber's one-moving-part construction assures you of continual operation in wide range of temperatures. It will also start and operate at all times and is not affected by humidity.

AiroViber's simple design assures trouble-free vibration.

Enter 1529 on Reader Card

How It Operates

Vibration necessary to keep materials from jamming, arching or hanging up in bins, hoppers, chutes, feeders . . . is created by the AiroViber vibrator through action of a single heavy steel ball blown by compressed air around a hardened and ground steel track in the housing. A strong centrifugal force developed by the weight of the ball is then transmitted by the vibrator through its mounting into the object being vibrated.

Installation Is Easy

Because of its simplified design, AiroViber may be installed quickly and easily. And, since no upkeep is required, you can install this vibrator in hard-to-get-at locations . . . fully confident that it will operate for a long time without lubrication or maintenance. Special line oilers or air filters are not needed . . . merely hook up an air hose large enough to deliver air specified for the unit you select.

Find out how AiroViber vibrators can save you money and time in moving bulk materials. For free illustrated literature and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif., Dept. 11C10.

VIBRATORS SINCE 1931

mixed concrete suppliers:—(1) failure to live up to delivery commitments; (2) selling prices out of line; (3) lack of uniformity; (4) slump not as ordered; (5) shortages on yield; (6) concrete does not meet strength specifications; (7) poor finishing qualities; and (8) improper preparation of winter concrete.

There may be a number of other reasons why a contractor does not buy from a certain ready mix producer:—(1) competitor is underselling; (2) there hasn't been sufficient sales effort; (3) prospect resents some phases of sales policy (e.g., soliciting business from do-it-yourself customers); (4) poor appearance of mixer trucks has made a bad impression; (5) uncooperative drivers have been sent to his jobs; (6) prospect doesn't like certain employes of the company; (7) dispatcher had lied to him; (8) prospect couldn't get early morning deliveries of concrete; and (9) company had turned him down during cement shortage period.

In supporting the work of his sales representatives, a producer can use the telephone and personal letters to express appreciation for the courtesies shown to a salesman, bringing a complaint to his attention, the receipt of an order, the giving of a construction lead, assistance in landing some new work, telling about a new product, pointing out a way to improve service, or for any other expression of interest in the welfare of his company.

A producer can aggressively merchandise his concrete successfully even without an organized advertising program if he and his key employees are sales minded. Just providing the right answers to the questions listed below will prove most helpful. Any producer, with a little thinking, can provide additional checks that will quickly lead to improved selling efforts.

Are you aggressively following up all new construction leads? Do your sales representatives have proper contacts in state, county, and township engineering offices? Are your relations with architects what they should be? Are cement suppliers advising you regularly as to new construction developments? Can you improve relations with finishers? Are you regularly checking with realty offices, excavating firms, and lumber companies for construction "tips"? Are drivers and other employees helping to bring in new business? Do you maintain an efficient control list over customer purchases? When sales to regular customers fall off, do you make prompt contacts with these customers? Do you make a regular practice of seeing contractors whom you haven't previ-

(Continued on page 243)

BIG PROFITS FOR READY-MIX OPERATORS

WITH RCA TWO-WAY RADIO

Why are the leaders choosing RCA 2-Way Radio?

Most of them say they are impressed by RCA's fine service organization and the years of RCA leadership in radio and electronics. Look for these marks of quality: Superior crystals, tubes and microphones for plainer talking, longer life . . . heavy-gauge steel case for rugged service . . . color-coded tuning for simplest maintenance . . . expert service by RCA Service Company to assure peak performance.

You are always in touch with your drivers when agitator trucks and supervisors' cars are equipped with RCA 2-Way Radio. As a result . . .

- Trucks can be re-routed in emergencies, avoiding delays and losses, increasing profits.
- Plants can close earlier and users report savings in overtime up to 20-30% per month by knowing in advance when the last truck will be in.
- Trucking productivity is vastly improved . . . 10 trucks radio-equipped have been found equal to 11 trucks (or more).
- Telephone expense is reduced —you save money on every call you don't have to make.
- Faster service you can render makes a hit with your customers . . . it's a money-maker for them . . . business-getter for you.

DISPATCHER 2-WAY RADIO TO DRIVER

Get the whole story—Mail Coupon

RADIO CORPORATION of AMERICA

COMMUNICATIONS EQUIPMENT

CAMDEN, N. J.

Radio Corporation of America, Communications Equipment

Dept. K-289, Building 15-1, Camden, N.J. In Canada, RCA VICTOR Company Limited, Montreal.

☐ Please send me complete information on the use of 2-Way Radio in Ready-Mix Operations.

☐ Have an RCA Communications Specialist make a free RADIO SURVEY of my business.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

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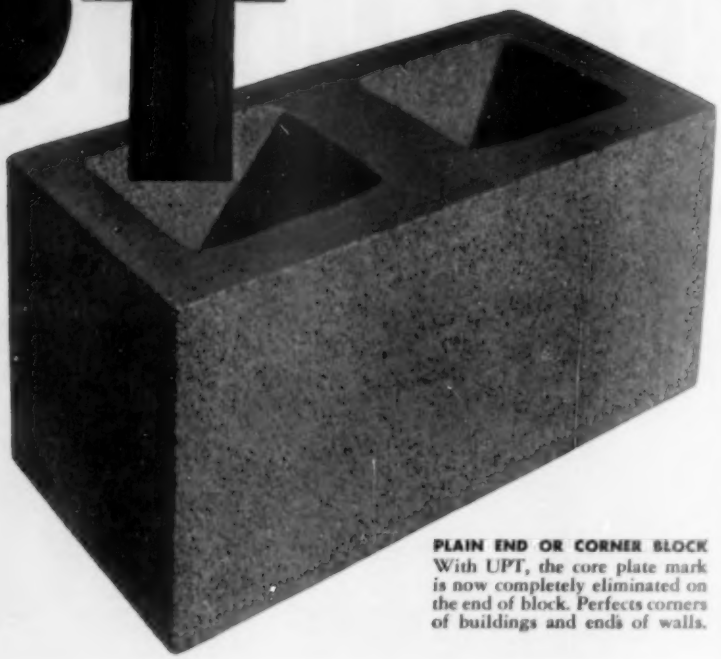
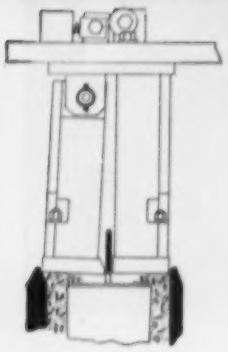
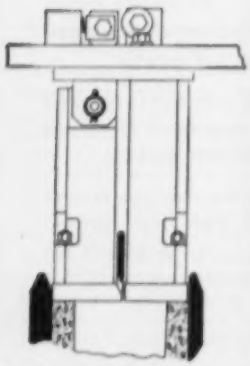
now BESSER gives you

UPT*



PLAIN END OR CORNER BLOCK With UPT, the core plate mark is now completely eliminated on the end of block. Perfects corners of buildings and ends of walls.





Upper drawing shows swinging stripper shoe contacting thick beveled division plate, ready to move to right — to contact stationary stripper shoe — to produce a block with U.P.T.

Lower drawing shows swinging stripper shoe—after clearing higher core plate — and contacting stationary shoe — ready to strip U.P.T. block.

FIRST IN PRODUCING A BUILDING BLOCK WITH UNI-PRESSED TOP*

Again Besser forges ahead with another FIRST in the Concrete Block Industry. This time it's U.P.T. . . . a block with *Uni-Pressed Top* . . . entire top surface made smooth. Note these new U.P.T. features:

- **Block has no machine marks, whatsoever.**
- **All six sides are now smooth.**
- **Concrete under core bar—packed the same density as rest of block.**
- **Higher division plate required, provides means for packing block edges better.**
- **Materially reduces grinding on floor filler units — as block is smooth.**
- **Makes perfect job of pressure grouting floor and roof planks — no weak points in center of block.**

U.P.T. attachments are available in 3 core, 2 core and floor & roof filler block. Get all the facts from your Besser representative, or write:

BESSER VIBRAPAC — the fully automatic concrete block machine. Produces high quality masonry units, of any desired texture and density, at the lowest possible cost.

A 8889-1PBC

BESSER COMPANY

World's Leading Manufacturer of Concrete Block Machinery

ALPENA, MICHIGAN, U.S.A.

SELLING READY MIX

(Continued from page 240)

ously sold or whose business you've lost?

To back up an aggressive selling program insist upon fine appearing, proper operating delivery equipment; process and deliver a quality concrete; provide efficient service; demand efficiency and integrity in your order-taking and dispatching departments; train drivers to give full cooperation on jobs; promptly handle all complaints and put good customer relations at the top of your list.

The producer, salesmen, service engineers, order-taker, dispatcher, plant men, and drivers should all have a part in the personal selling job undertaken by a ready-mixed concrete company.

Concrete Firms Tabulated

BUREAU OF THE CENSUS, U. S. Department of Commerce, has released figures indicating that at the end of 1954 there were 1996 establishments in the continental United States with paid employees and primarily engaged in selling ready-mix concrete. Sales of such businesses totaled $1 billion in 1954, or approximately $501,000 per annum per organization.

States recording the largest dollar volume of sales in 1954 were California, New York, Illinois, Texas, Ohio, Michigan, and Pennsylvania, in the order named. Together, these seven states reported sales totaling $538.2 million, or more than half of the total for the country as a whole.

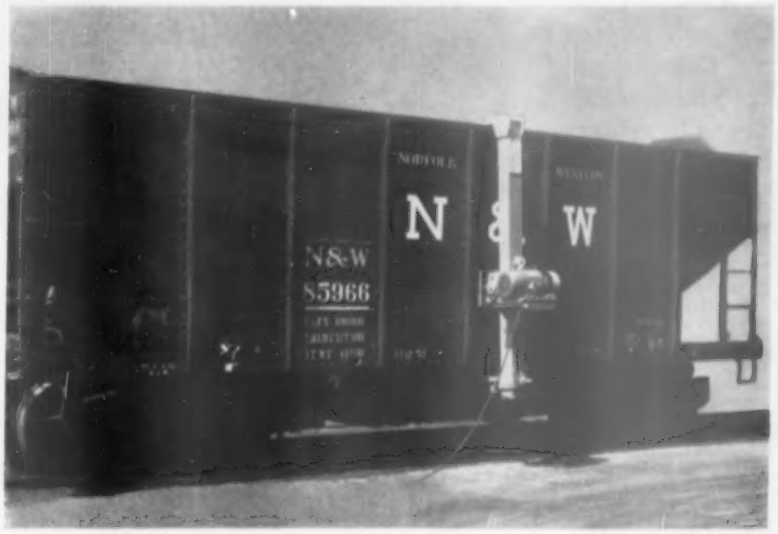
Top User of Precast Roofs

THE AUTOMOTIVE INDUSTRY has been reported to be the largest user of precast concrete roof deck material during the past 10 years, according to a survey conducted for the roof deck manufacturers. The survey estimated that approximately 30,000,000 sq. ft. was installed for 181 automotive plant owners at 343 locations during the 10 years ended December 31, 1954.

Two Research Projects

NATIONAL CONCRETE MASONRY ASSOCIATION, Chicago, Ill., has signed a contract for two important research projects. R. E. Copeland, director of engineering, revealed that the University of Toledo will make investigations on the tensile bond between mortar and concrete masonry units and the effect of accelerated carbonation treatments on masonry units. Prof. Edwin L. Saxer will direct the projects for the University of Toledo.

the NATIONAL CAR SHAKER costs little—works hard



Profits for you are the result of the National Car Shaker— profits derived from the fast, efficient, complete unloading of aggregates with only **one** operator.

The National Car Shaker combines low cost with the best engineering principles such as all-welded box girder frame, patented rubber-to-rubber motor mount, hardened bolts and nuts and triple V-belt drive.

Many years of trouble-free operation are yours with the National Car Shaker. The first one produced is still in daily operation after eight years of the roughest work.

Write for full information on the money-saving National Car Shaker today—right now.

NATIONAL CONVEYOR AND SUPPLY COMPANY

356 N. Harding Ave. Chicago, Ill.

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Enter 1629 on Reader Card

SIDE-O-MATIC

Progressive City Cement Block Company, Bridgeport, Connecticut Side-O-Matic Fleet Has

Increased Their Customer Satisfaction and Brought in New Business!

PARTIAL LIST OF SATISFIED USERS:

Foster Builders Supply Company
Port Huron, Michigan

Atlas Concrete Products Co., Inc.
Patchogue, L. I., New York—2 units

City Cement Blocks Co.
Bridgeport, Connecticut—3 units

The Ideal Builders Supply and Fuel Co.
Cleveland, Ohio—2 units

Apex Coal and Supply Co.
Cleveland, Ohio

Binkley and Ober, Inc.
East Petersburg, Pa.—2 units

The Michigan Silo Company
Peoria, Illinois—2 units

Joseph M. Ripley, Inc.
Jacksonville, Florida—3 units

Pick's Pack-Hauler
Blue Hill, Nebraska

Schenectady Cast Stone Co., Inc.
Schenectady, New York

Raymond W. Bartlett
West Creek, New Jersey

Concrete Masonry Corporation
Elyria, Ohio—4 units

Fizzano Brothers, Inc.
Crum Lynne, Pennsylvania

Maule Industries, Inc.
Miami, Florida—2 units

South Hammond Concrete Products Co.
Hammond, Indiana

Flower City Builders Supply Corp.
Rochester, New York

Hitterhouse Concrete Products
Chambersburg, Pennsylvania

Marquart Concrete Block Company
Waterloo, Iowa

The Plasticrete Corporation
New Haven, Connecticut—2 units

The Cleveland Builders Supply Co.
Cleveland, Ohio—2 units

Putnam Mason Supplies, Inc.
Carmel, New York

Tait Block and Supply Company
Port Huron, Michigan

Daggett's Concrete Products
South Haven, Michigan

Fairlawn Supply and Coal Company
Akron, Ohio

Polyock Brothers
Zenda, Wisconsin

Atlas Concrete Products, Inc.
Flint, Michigan—2 units

Allen County Concrete Products
Lima, Ohio

Meekins, Inc.
Hollywood, Florida—2 units

Carl Krebs
Fort Thomas, Kentucky

Picone Brothers
Farmingdale, Long Island, New York

Lima Cement Products Company
Lima, Ohio

Peoria Concrete Construction Co.
Peoria, Illinois

M. L. Dague Co.
Muncie, Indiana

Columbia Concrete Products Co.
Des Moines, Iowa

Iowa Concrete Block and Material Co.
Des Moines, Iowa

Bestone Incorporated
Chardon, Ohio

New Castle Duntile Company
New Castle, Pennsylvania

R. I. Lampus Co.
Springdale, Pennsylvania

Park Avenue Cement Block Co., Inc.
Cranston, Rhode Island

Bes-Block Concrete Products, Inc.
Jacksonville, Florida—3 units

Adolf Jandris & Sons, Inc.
Gardner, Massachusetts

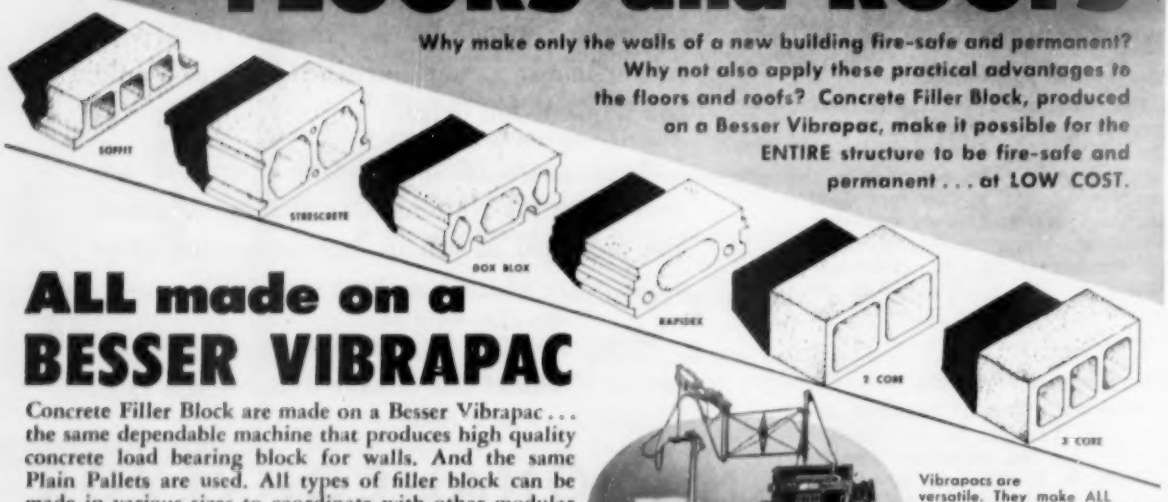
SIDE-O-MATIC UNLOADER CORP.

P. O. Box 1561, York, Pa. • Phone York 7357

Enter 1633 on Reader Card

Concrete Filler Block for *Fire-Safe* FLOORS and ROOFS

Why make only the walls of a new building fire-safe and permanent? Why not also apply these practical advantages to the floors and roofs? Concrete Filler Block, produced on a Besser Vibrapac, make it possible for the ENTIRE structure to be fire-safe and permanent . . . at LOW COST.



ALL made on a BESSER VIBRAPAC

Concrete Filler Block are made on a Besser Vibrapac . . . the same dependable machine that produces high quality concrete load bearing block for walls. And the same Plain Pallets are used. All types of filler block can be made in various sizes to coordinate with other modular materials and for all load conditions. Block plant operators can materially add to their profits by supplying their customers with BOTH wall and floor units. For further facts, contact your nearby Besser representative, or write:

Vibrapacs are versatile. They make ALL types and sizes of block on ONE set of Plain Pallets. Fully automatic. Off-bearer removes finished block with power hoist. No manual lifting.

BESSER COMPANY • Complete Equipment for Concrete Block Plants • Alpena, Michigan, U. S. A.

Enter 1634 on Reader Card

Predict Record High In Perlite Production

PERLITE INSTITUTE, New York, N.Y., at its seventh annual meeting, predicted that perlite production will reach a record high of more than a quarter of a million tons in 1956. Sales in 1955 reached 220,000 tons, topping 1954 production by 12 percent, with a value of $11,000,000, as compared to $9,500,000 in 1954.

Four new officers were elected at the meeting. Elected president was J. C. Kingsbury, vice-president, F. E. Schundler & Co., Inc., Joliet, Ill., who succeeded Lewis Lloyd, president, Alatex Construction Service of New Orleans, La. Others elected were: vice-president, Kirk E. Hazelton, assistant general manager, Perlite Division, Great Lakes Carbon Corporation; and directors, C. Robert McCormick, vice-president, Whittemore Co., Boston, Mass., and Lewis Williams, president, Perlite Industries of Arizona, Inc., Phoenix, Ariz.

Richard S. Funk, administrative secretary, and Richard J. O'Heir, technical secretary, continue as co-managers of the Institute. In his annual report to the Institute's membership, Mr. Funk stated that perlite today "enjoys about 40 percent of the entire plaster aggregate market and is the aggregate most widely used by the plastering industry."

Most significant recent development, Mr. Funk said, is the growing popularity of perlite insulating concrete for roof construction. Nearly 25 million sq. ft. were laid during the past year. Perlite insulating concrete combines the functions of structural deck and insulation with a single application.

Soon to be distributed is a comprehensive 80 page perlite concrete design manual now being prepared by the Institute. It will be distributed to architects, contractors, and related groups in the construction industry, furnishing design data on roof decks, floor slabs, floor fills, and curtain walls.

Archie N. Solberg, Dean of Research and Special Services at the University of Toledo, told Institute members of progress being made in a comprehensive study on perlite and its basic uses at the university. Other new research was authorized at the meeting. Funds were made available for the establishment of research projects at universities in the South, Midwest, and East to study the value of perlite as a soil conditioner, seed-starting and root medium, and as a packaging material for shipping potted plants and nursery stock.

Featured speaker at the annual meeting was L. H. Hobson, president,

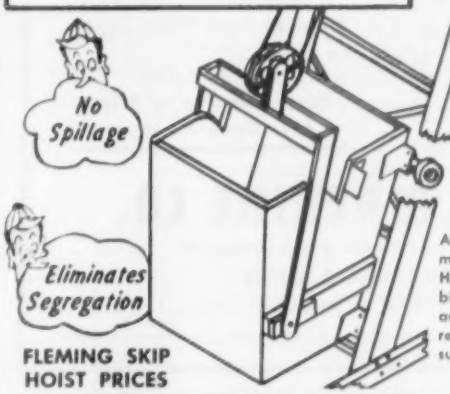
Step Up Efficiency, Cut Operating Costs

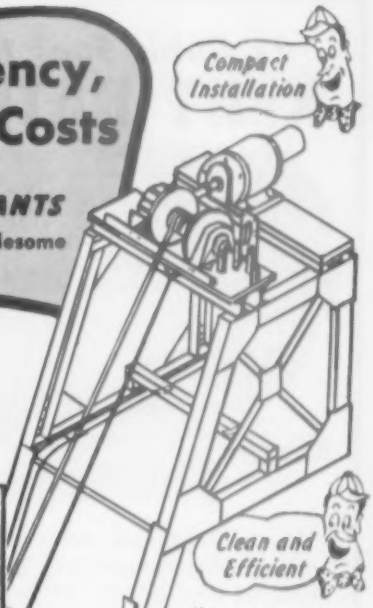
OF ONE-LEVEL CONCRETE BLOCK PLANTS

by Replacing Wasteful, Troublesome Belt Conveyors with

FLEMING SKIP HOISTS

FOUR SIZES
14-28-36 and 50-Cu. Ft. Capacities—to Fit Your Requirements. Completely Automatic Operation.





If you operate a one-level block plant, you know that production stoppages caused by spillage, and man-hours of costly clean-up time cut into your profits. Best way to eliminate them is to install a Fleming Skip Hoist to elevate the mix to the hopper on top of your block machine. Then you're sure of getting peak production of concrete block day-after-day, and never have to worry about mix spilling over the sides of a conveyor belt and "hanging it up" . . . or time wasted digging out overflow to free the belt . . . or cost of extra cement required to bring recovered material back to life. What's more, the job of sweeping-up around quitting time is reduced to mere minutes because Fleming Skip Hoists are clean-operating — not messy — thus saving you about a half hours' labor every day.

Available in four sizes and capacities to meet your individual needs, Fleming Skip Hoists work efficiently with any make block machine. They are rugged, compact, automatic. Eliminate spillage, prevent segregation. Sturdy all-steel construction assures long, trouble-free performance.

FLEMING SKIP HOIST PRICES

MODEL NO.	CAPACITY	PRICE
FMC-14	14 Cu. Ft.	$1490.00
FMC-28	28 Cu. Ft.	$1990.00
FMC-36	36 Cu. Ft.	$2490.00
FMC-50	50 Cu. Ft.	$2850.00

FLEMING
MANUFACTURING CO.
487-J FLEMING AVE., CUBA, MO.

Fill Out This Coupon —

MAIL TODAY! for Complete Details on Fleming Skip Hoists.

Fleming Manufacturing Co.,
487-J Fleming Ave., Cuba, Mo.
Please rush complete specifications, including terms, on Fleming Skip Hoists.
Also request information on:
☐ Flem-Stone Automatic Block Splitter
☐ Automatic Single and Double Block Machines.
Name _____
Firm _____
Address _____
City _____ Zone ___ State _____

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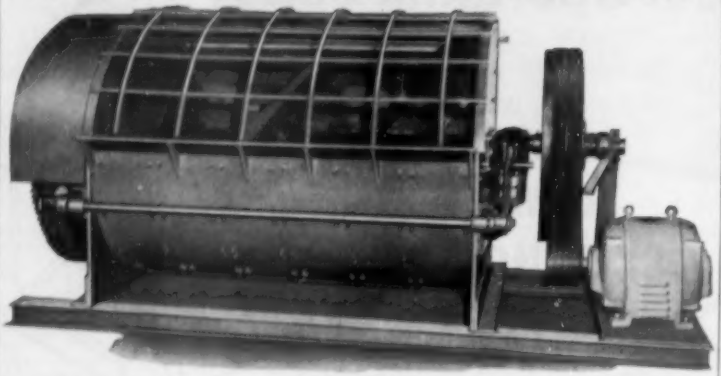
12 Cubic Foot to 75 Cubic Foot
KENT BATCH MIXERS



This large capacity mixer combines features that assure safe, convenient operation and large output of thoroughly mixed concrete *economically.*

Gearing is precision cut. Motor, positive action clutch, belts and bearings are specially designed for heavy duty. Motor and bearings are sealed to exclude dust and grit.

Mixing blades are a superior quality of cast steel. Liners are of sectional type cast from NI-HARD metal, in the larger size mixers. They will render exceptionally long service and may then be replaced easily.

Write for information regarding the complete Kent line of Batch Mixers or Kent Continuous Mixers if interested in this type.

See
KENT MACHINERY IN OPERATION
Right In Your Own Office

Just Ask Our Representative to Bring His Movie Projector

The KENT MACHINE CO.
DIVISION OF THE LAMSON & SESSIONS CO.
CUYAHOGA FALLS, OHIO
CONCRETE PRODUCTS MACHINERY SINCE 1925
Canadian Distributor: Wetlaufer Equipment, Ltd., 49 Merton St., Toronto 12, Ontario

Enter 1646 on Reader Card

E-Z On Corp., Chicago, pioneers in the manufacture and development of spray guns for the application of lightweight plaster and concrete. Mr. Hobson described advantages of perlite concrete in curtain wall construction.

Movies of the new Hillside Shopping Center near Chicago were shown by Mr. Hobson to illustrate his talk. The center features the type of perlite concrete sprayed curtain wall pioneered in the 30-story Alcoa Building in Pittsburgh. This wall consists of an aluminum skin and an entirely independent perlite concrete curtain wall. It has a four-hour fire rating. In event of fire, the metal face might be destroyed, but the independent perlite concrete wall would still offer wind and fire protection.

The Perlite Institute is preparing a pamphlet on perlite concrete curtain wall designs, featuring the Alcoa building and others where the process was used in construction.

As outlined at the annual meeting, the objectives of the Perlite Institute concern primarily the adoption and observance of uniform perlite specifications from coast to coast. Members were informed that there was increased acceptance and use of the Institute's certification seal during 1955. About 90 percent of eligible members now use this trademarked seal on bags of perlite aggregate to guarantee quality and conformance to A.S.T.M. specification C 35-54 T. The seal also indicates regular sampling and testing of the aggregate by the Pittsburgh Testing Laboratory.

Satisfactory on-the-wall strength of perlite plaster, members were told, is best obtained by using fast-setting gypsum. In areas where fast-setting gypsum is not available, contractors were strongly urged to add sufficient accelerator to assure a plaster setting time of from three to six hours.

Present at the meeting were representatives of 25 perlite producing companies in 21 states.

FOR GREATER PROFITS—BUILD APPROVED CONCRETE SEPTIC TANKS with

NORWALK EQUIPMENT

Build rectangular concrete septic tanks that will meet the most rigid specifications of local health officers and sanitary engineers. Build them QUICKER and at LOWER COST with NORWALK septic tank molds.

Molds built to your requirements

Write for details

THE NORWALK VAULT COMPANY
Dept. CP • NORWALK, OHIO

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NR Plastic

1 TABLESPOON OF DRY POWDER Per Bag of Cement Produces
Greater Plasticity
IN THE GREEN UNIT Plus
20% Lighter Color
COST—1/2¢ per Bag of Cement!

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NEW TRANSISTORIZED POWER VOICE speaker

The secret is in the exclusive **"GOLDEN HEART"** *transistor*

Hear your mobile radio

HUNDREDS OF FEET AWAY

Now your vehicles, in fact any mobile radio equipped **vehicle, can get far greater** volume than ever before, with **the new Motorola** transistorized Power Voice Speaker.

This new compact, inexpensive speaker-amplifier **combination delivers** 10 TIMES MORE POWER than **the conventional** passive speaker. No more straining to **hear messages**. Just turn it up—it's got all the volume **you'll *ever*** need, all in this one small package. No longer **is your driver** shackled inside his vehicle...he can **move about** freely, hundreds of feet away, and still **hear his** dispatcher.

Secret of Motorola's newest development is the built-in **transistorized amplifier**, utilizing two long-life, Motorola power transistors. With the average 12 volt mobile radio system, the new speaker develops *15 watts* audio output. Even on a 6 volt system, you get 5 watts output—*much* more than the conventional one watt speaker level.

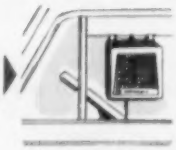
This power packed speaker is available for your mobile 2-way radio NOW. It can be quickly and easily added to most 6 or 12 volt installations. With the new Power Voice Speakers doing a bigger, better job for you, you'll also find low battery drain, bandpass response that accents voice frequencies, and versatile Quick-detach mounting...in a compact, all-metal housing.

You must *hear* the new Power Voice Speaker to appreciate what this added power can mean to you. Write, phone or wire today...or mail the coupon below.

New POWER VOICE speaker mounts firmly under dash in same familiar position

BUT...

detaches in a second to be hung from vehicle window and may be heard clearly hundreds of feet away.



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Lift truck with ten forks reduces block handling cost

Step Up Intra-Plant Haulage

Janesville Sand and Gravel Co., uses larger capacity fork lift trucks in block plant

LARGER CAPACITY LIFT TRUCKS equipped with specially designed block-handling forks have cut down intra-plant transportation costs for the Janesville Sand and Gravel Co., Janesville, Wis. The new lift truck is used primarily for cleaning the yard, putting block into storage and loading out trucks. It does not, at any time, go into the curing rooms. The curing rooms are filled and emptied by platform trucks which take the racks out into the yard for unloading and palletizing the cured block for the large capacity lift trucks to pick up and place in storage.

The new lift truck is a Hyster 80 equipped with special J. P. Waite, Inc., block handling forks.

Superintendent George Meyer pointed out that the first Hyster 60 purchased proved too small to do the job expected of it, and it was thought that sufficient block could be added to the "60" load to do more work than the 4000-lb. capacity units. However, it was decided that the "80" model could handle more economically the loads formerly carried by the two 4000-lb. capacity units. The saving is one man and one machine.

The "80" model has ten forks and the "60" model has five forks. Forks are 38½ in. long. Loads handled by the "80" model are 180-8-in. Waylite block; 90- 10-in. sand and gravel; 120-10-in. Waylite block; 80-12-in. sand and gravel block or 120-12-in. Waylite block. The 8 in. sand and gravel block weigh 41¼ lb. The standard 8-in. Waylite block each weigh 32¾ lb.

It is essential that a good smooth, flat surface be used in the area where the model 80 operates as the load carried presents a wide package. Any serious irregularities in the surface would make it impossible for all ten forks to be inserted in the package. The Janesville Sand and Gravel Co. is fortunate in having a well-maintained concrete paved yard for this purpose.

Expanded Shale Concrete Bulletins

THE EXPANDED SHALE, CLAY AND SLATE INSTITUTE has published lightweight concrete Information Sheet No. 3, a companion piece to No. 1, dealing with the design of expanded shale lightweight concrete mixtures. Both bulletins are available from the Institute, free of charge, at 658 Warner Building, Washington 4, D. C.

New Lightweight Concrete

CONCRETE UNITS manufactured from slate ashes, lime and sugar, have been developed and patented by Bertil Carlen of Hallabrottet, Sweden. Manufacturing rights to the lightweight, gaseous concrete product have been assigned to International Ytong Co., Aktiebolag, Stockholm, Sweden.

THE MOST POWERFUL truck-man YET!

THE Y-60
WITH
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ENGINEERED FOR RUGGED DUTY OUTDOORS WITHOUT OPERATOR FATIGUE. HIGHLY MANEUVERABLE UNDER ALL CONDITIONS.

Truck-man scores again with a heavy duty, versatile, time saving Powerhouse on Wheels • 6 cylinder—73 h.p. Industrial Engine. Oversize Brakes and Clutch • Welded All-Steel Frame • Extra Heavy Transmission Wide Tread, 12 ply load tires • Speeds to 20 miles per hour, forward and reverse • Mast tilts 10° forward, 4° back • Standard Parts Throughout • Easy and Economical to Repair • Special equipment available.

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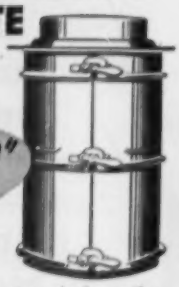

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Free CATALOG

Illustrates our complete line of equipment. Contains pages of valuable tips for the concrete pipe manufacturer. Write today for your free copy and estimates.

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Portable concrete batching of Highway Products Co., Pittsburgh, Penn., services the construction of a commercial atomic power plant

Plant Serves Atomic Job

HIGHWAY PRODUCTS CO., Pittsburgh, Penn., has set up a Blaw-Knox portable batching unit at the first commercial atomic power plant being built for the Atomic Energy Commission and Duquesne Light Co. at Shippingport, Penn. Capacity operation of the 600-bbl. high bin and 400-bbl. low bin units has run as high as 1500-bbl. per day. With the completion of the current project late this year, the equipment will be dismantled and moved to the site of a new project.

F.C.P.A. Elects Officers

FLORIDA CONCRETE AND PRODUCTS ASSOCIATION, INC., held its second annual convention at the Tides Hotel, St. Petersburg, Fla. Officers elected are: Neilson Jones, Maule Industries, Miami, president; Ernest Kilgore, Pinellas Concrete Products Co., St. Petersburg, first vice-president; Frank Williamson, Holloway Concrete Products Co., Winter Park, second vice-president; and Hugo Quillian, Quillians' Concrete Co., Daytona Beach, secretary-treasurer.

Five new directors, elected for 3-year terms, are: Evon Brewton, Brewton Engineering Co., Tallahassee; Jim Graham, Burnup and Sims, West Palm Beach; Kenneth Hill, Kissara Builders Supply Co., Orlando; Charles Poe, Tampa Sand and Material Co., Tampa; and J. W. Taylor, Capitol Concrete Co., Jacksonville. Bill Hicklin, Jr., Capitol Concrete Co., Jacksonville, served the association as its first president.

Masonry Unit Standards

AMERICAN SOCIETY FOR TESTING MATERIALS, Philadelphia, Penn., Committee 015 on Manufactured Masonry Units, has provided additional coverage as well as changes in existing standards on both concrete and clay type units. A new method for measuring moisture content in concrete masonry units, using a relative humidity method, will be recommended to the committee at the next meeting.

The existing tentative revision to the Standard Methods of Sampling and Testing Concrete Masonry Units (C 140), that authorizes the use of either cement-gypsum capping or sulfur-filler capping, was approved.

Dayton Firm Expands

DAYTON BUILDERS CONCRETE CO., Dayton, Ohio, has opened a new automatic batching plant to supplement its central-mix plant. The combined operation supplies concrete for 33 tandem-type trucks. B. A. Wettig is president of the firm, organized in 1947.

A.C.I. Issues Index

AMERICAN CONCRETE INSTITUTE, Detroit, Mich., has published an index to the Journal of the American Concrete Institute covering Sept., 1949 to June, 1954. A brief synopsis is given for each paper.

MOISTURE CONTROL PROBLEM?
BUT MOISTURE CONTROL IS SIMPLE!

It does it . . .
Automatically
INSTANTLY
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"INSTALLED IN YOUR PLANT, BY OUR ENGINEERS—ONLY $669.00"

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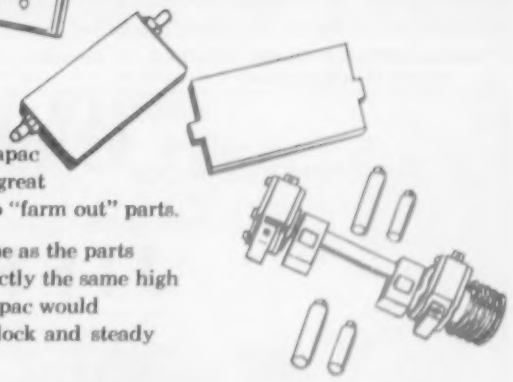
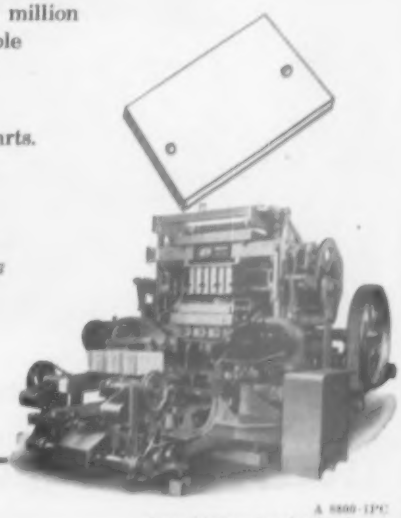
The same engineers and skilled mechanics who design and build the famous Besser Vibrapac produce all parts for the machine . . . right in this great Besser plant at Alpena, Michigan. Our policy is not to "farm out" parts.

Genuine Besser Parts are identically the same as the parts used for the original equipment. They are made to exactly the same high standards. They have to be. Otherwise your Vibrapac would not give you the high output of quality block and steady uninterrupted performance for which it is noted.

To insure quality control, Besser invested more than a million dollars in a Heat Treat Department. Quality control is impossible if the parts are "farmed out". As a result, Genuine Besser Parts fit perfectly, last longer, cost you less.

Get the *most* from your Vibrapac with *Genuine* Besser Parts.





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TRINITY WHITE

The whitest white. A true portland cement that combines high quality and superlative beauty in concrete work. The extreme whiteness gives truer colors when pigments are added. Meets all Federal & ASTM specifications.

As white as snow

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EFFICIENTLY . . . SAFELY . . . PROFITABLY

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Three times the deliveries—even at seasonal peaks
Safe and easy one-man operation
FOUR WHEEL DRIVE—Smoother—Reduces Slippage—Safer
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MODEL E 6	MODEL E 7
Handles 180—42 lb. blocks 7560 lbs.	Handles 210—42 lb. blocks 8820 lbs.
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ALL PARTS, BOTH MODELS, STANDARD ITEMS; EASILY REPLACED IF DAMAGED.

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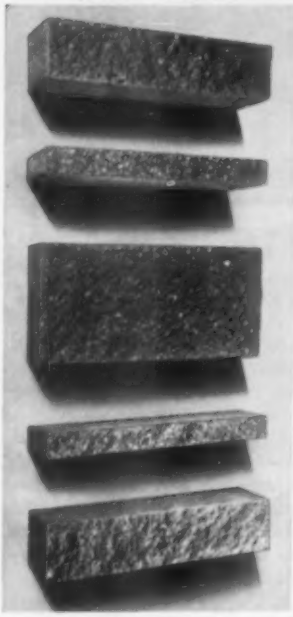
BES-STONE *Split Block* MAKES the Difference *

* Advances architectural design and beauty

* BOOSTS YOUR PROFITS!

TWO SIZES: 18" and 24"
Automatic operation — 960 Split Block per Hour



• Add a BES-STONE BLOCK SPLITTER to your plant NOW

You'll find it full of profit-opportunity because the trend toward BES-STONE Split Block is strong! Architects, contractors, owners WANT this beautiful, modern, colorful "quarried stone" effect that is so ideal for all structures . . . commercial, institutional, residential. BES-STONE Block Splitter makes straight line cuts . . . no cull block. Automatic hydraulic operation . . . up to 960 Split Block per hour . . . safe, quiet . . . a big money maker!

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BES-STONE *the Split Block with Character*

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EVERY TIME

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SAVES YOU MONEY!

Your bankroll is taking as bad a beating as your buckets—if you have to kick, bang and batter them constantly to get them clear of jammed or frozen plugs of sand or other granular loads.

Loads *can't* stick in PEKAY *M-T-Matic* buckets, even if frozen or close-packed! The separately mounted stripper plate applies irresistible leverage to bucket contents—*empties completely* on every trip! You handle *more* material at the same or higher belt speeds—cut belt replacements too!

the patented

PEKAY M-T-MATIC ELEVATOR CONVEYOR BUCKET

Available in all standard sizes

Thousands of *M-T-Matics* now in use are making money for users everywhere, handling sand, cement, similar materials. Easy to install on any elevator conveyor. Quick deliveries!

Write today for low prices!

Separately mounted back automatically acts as stripper-plate to assure complete emptying. Irresistible leverage develops as bucket goes over top pulley, sweeping contents entirely clean. Buckets have standard pickup capacity. Double mounting makes belts last much longer.

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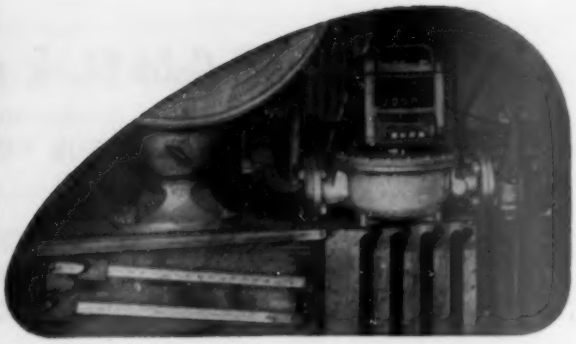

Better Concrete with *METERED* Water

Most important problem in ready-mix concrete is control of water . . . and the simplest, surest control is this Auto-Stop water meter. Just push buttons to set pounds or gallons required, open the valve, and the meter shuts off automatically. Speeds loading, and improves block machine performance. Easy to read, saves space, and reduces structural requirements. Round dial non-Auto-Stop also available. Write today for full details . . .

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SAVE FUEL • REDUCE CURING TIME
CUT COSTS • UP PROFITS
with *Standard* KILN DOORS!

WHERE AISLE SPACE IS LIMITED STANDARD sliding doors need no aisle space. The carrier-type door (shown) requires 15" minimum clearance above top of door opening. A vertical sliding door, counterweighted for easy opening, is also available.

WHERE HINGE-TYPE DOORS ARE PREFERRED Choose from two STANDARD hinge-type doors. The top-hinging door (shown) can be used when there's insufficient room at sides of door. The conventional side-hinging door has rugged hinges and positive-seal lock.

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- √ Heavy Aluminum Sheets on Both Sides of Thick Vapor Proofed Insulation.
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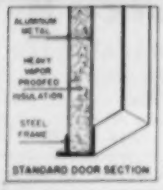

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Get the Best — Send for Details Now

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Erickson Pioneered CUBING

New Superior Features Still Make

Erickson **F-6R THE IDEAL TRUCK FOR THE CONCRETE INDUSTRY**

Erickson Fork Trucks have a proven 30-year record for low-cost handling of concrete block cubes in the yard — stock-piling, loading and unloading delivery trucks.

New twin cylinder mast construction assures full operator vision • new 12" clutch with Timken combination drive axle and transmission • new high H. P. engine, easily accessible with tip-up hood. Large 8:25x15 tires provide easiest rolling and surest traction (*all* tires interchangeable.) Available with forged steel flat forks or Jalloy No. 1 cubing forks. ***WRITE FOR LITERATURE!***

F-6R with dual tires on drive and steering wheels.

"THE WORKHORSE OF LIFT TRUCKS"

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Because of our greatly expanded facilities in both Vancouver, Wash., and Mattoon, Ill., Columbia can now offer delivery on most Batch Mixers in a matter of only a few days following the receipt of your order.

Model 50
54 cu. ft. capacity

Columbia

BATCH MIXERS

Columbia Mixers are manufactured in sizes and capacities to meet industry demand. The following five models are now available:

MODEL 12 (12½ cu. ft.) **MODEL 25 (27 cu. ft.)**
MODEL 40 (45 cu. ft.) **MODEL 50 (54 cu. ft.)**

MODEL 75 (81 cu. ft.)
Handles 10,000 pounds of mix at one charge.

Columbia FEATURES

Heavy duty SKF dust-proof bearings • Toggle-operated self-discharging gates • Spiral blades made of long-bearing Nihard steel • Rugged all-welded construction • Low charging side allows use of batchers and measuring devices • Heavy-duty electric motors insure efficient operation with full loads • Heavy cut gears give positive drive and long wear • Safety grids made of heavy bars • All models can be equipped with hydraulically-operated doors at slight extra cost.

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Columbia MACHINE
Home Office: 107 S. GRAND, VANCOUVER, WASHINGTON
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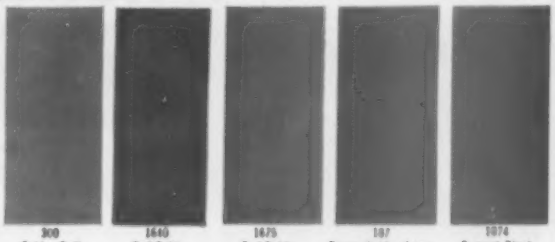

A guide for choosing concrete colors

For producers of split blocks, patio blocks, concrete blocks and other colored concrete products.

Manufacturers of colored concrete products agree . . . *The pigments they use must have these 3 important qualities:*

1. A high degree of tinting strength when added to the mix
2. Color uniformity year in, year out
3. The ability to incorporate easily

Manufacturers also require a pigments supplier whose technical department is capable and cooperative, whose shipping service is prompt and dependable.

Point for point, REICHARD-COULSTON quality-controlled pigments and dependable service meet *all* these requirements!

The shades shown above are just 5 of the many concrete colors manufactured by REICHARD-COULSTON. Included are yellows, buffs, maroons, grays, reds.

For a free color card, fill in and mail the coupon. Act now.

GENERAL RECOMMENDATIONS: PASTELS (*Split blocks and similar products*), 2-4 lbs. for each bag of cement. DEEP SHADES (*Patio blocks, concrete blocks, etc.*), 6-8 lbs. for each bag of cement.

Reichard-Coulston, Inc.

15 EAST 26th STREET, NEW YORK 10, N. Y.

Warehouses in principal cities; factory: Bethlehem, Pa.
Over a century of manufacturing and service

Natural IRON OXIDE PIGMENTS *Synthetic*

REICHARD-COULSTON, Inc. CP-106
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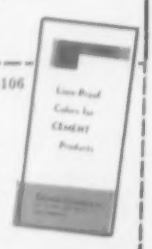

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HIGHWAY DIVIDERS

"BAR-X" BARBECUE & INCINERATORS

SPECIAL MOLDS MADE TO ORDER.

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For

BLOCKS
CYLINDERS
CUBES
BEAMS
LINTELS
PIPE AND SLABS

If it's a concrete tester you need—get in touch with

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 · NEW CASTLE, PA.

HIGH PROFIT LOW COST

Easy Stripping Metal Molds

Send for Free Bulletin

PARK MOLD & STEP CO.
1020 N. Raymond Rd. Battle Creek, Mich.

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1—L-2 Lith-I-Block machine with 6" attachment.
1—30 Cu. Ft. Gatske Mixer complete with 20 H.P. Motor.
1—30 Cu. Ft. Lith-I-Skip—Inclined Type
1—15 H.P. Quincy Air Compressor
1—Automatic Side Pallet Return
40-72-Block Steel Racks
1440—¼" x 18" x 22" Steel Pallets
2—Mold Box Shells

This equipment being replaced by H-310 3-block hydraulic Lith-I-Block Machine. May be seen in daily operation at Kirchner Manufacturing Co., 9921 St. Charles Rd., St. Anns, Missouri. Or contact:

LITH-I-BAR COMPANY
Holland, Michigan
Financing can be arranged.

MADISON BLOCK SPLITTER

Get the best for less

$1850.00 complete—ready to go to work. Why pay more?

Madison Block Splitter features the following:

(1) Hydraulic operation
(2) All welded steel construction
(3) Semi-automatic cycle
(4) Fast precision splitting
(5) Straight or angle splitting
(6) Simple installation, just run power to motor
(7) Minimum upkeep.

Specifications:

Splits blocks to 8" high.
Widths and lengths up to 24".
Big 8" hydraulic cylinder, develops up to 40,000 lbs. pressure on blades.
2 Hp. motor—choice of single or 3 phase—110v., 220v.
Hardened steel blades. Weight approx. 1600 lbs. Height 6' 1", Width 3' 2", Length 4 ft.

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MADISON MFG. CO.
R.F.D. 2, Adrian, Michigan

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BLOCK MACHINES

Stearns #7 & 9 Jolterotes	$500.00 each
(Jolterote owners at this price buy one for spare parts.)	
Mold Boxes #7 & 9	150.00 each
2—Stearns Clipper Strippers	250.00 each
1—18 ft. Stearns Skip Hoist	450.00
1—George 28 cu. ft. Concrete Mixer	750.00
1—Continuous Mixer	150.00
2—Air Offbearers Stearns #7 & 9	250.00 each
2—Hand Lift Trucks	175.00 each
100—Racks for cured steel pallets	10.00 each
100,000 pressed steel pallets in stock (Send tracing or sample for quotation).	

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Mr. McCaughey

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Route 130 Thorofare, N. J.
Phone: Tilden 5-5400

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1—30 Cu. Ft. Multiplex mixer
1—30 Cu. Ft. Lith-I-Skip inclined type
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1440—New ¼" x 18 x 22 steel pallets
2000—Used 5/16 x 18 x 22 steel pallets

Extra mold boxes and attachment to make all sizes blocks. Also brick

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5—Smith Mixers Model 553 size 6½

One year old taken in trade for larger mixers

Priced $2,500.00 each

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$5000.00 Complete

Model K 47 Hydro-Korpak block machine with 5 HP, 3 Phase, 60 Cy. motor and attachments to make all standard 8" blocks. 25" Gyromatic mixer completely equipped with 10 HP. back geared motor, and hoist with 5 HP. back geared motor including magnetic switch for automatic safety stop at top and bottom. 1—Korpak Stripper block machine with power feeder and hopper with Nema type drip-proof motor.
3000 pallets—perfect condition

MUST MOVE IMMEDIATELY

This equipment is in excellent condition and was used for experimental purposes only.

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Phone: Liberty 6-2403

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Jackson & Church 12 mould brick machine; Besser K3M Tamping block machine; Four 6' x 40' autoclaves with quick closing doors for 150 lbs. pressure; Two 183 H.P. Heine boilers with chain grate stoker; 27 block racks; 65 flat top cars 4' x 5', 24" ga.; Bucyrus Erie 15B-½ yd. shovel; Erickson fork lift truck & Clark fork lift truck, each 5,000 lb. capacity; Joy Mfg. Co. 7" x 7" air compressor & Pennsylvania air compressor, each with 30 H.P. motor and receiving tank; Williams 45 ton per hour hammer mill; 2 Dean Bros. boiler feed pumps; Cochrane water heater; Chevrolet Dump truck; 2 Pug mills; 2 dry pan mixers; 3000 pallets; Bins, hoppers, screw conveyors, belt conveyors, bucket conveyors, masonry saw, scales, 18 cu. ft. concrete mixer, and misc. equipment.

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Pacific, Missouri

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unbreakable
PALLET RINGS
Write for full information
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$6500.00
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LOWER COST
packer-head wings
Proved to last as long or longer — yet cost considerably less. Write for prices.
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...is the way our doctors put it—"Our chances of curing cancer are so much better when we have an opportunity to detect it *before it talks.*"

That's why we urge you to have periodic health check-ups that *always* include a thorough examination of the skin, mouth, lungs and rectum and, in women, the breasts and generative tract. Very often doctors can detect cancer in these areas long before the patient has noticed any symptoms.

For more life-saving facts phone the American Cancer Society office nearest you, or write to "Cancer"—in care of your local Post Office.

American Cancer Society

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Your contractor and bricklayer customers will be able to do quicker, easier, straighter work with UB Tools . . . tools that carry YOUR OWN COMPANY ADVERTISING. Linestretchers, Corner Ties, Line Pins, Twigs, Concrete Calculators. We also wholesale a complete line of Blocklayers' Tools. Write for literature and prices.
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We use Besser Equipment

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COLOR YOUR CONCRETE WITH LANSCO CEMENT COLORS, available in 40 ATTRACTIVE shades. Suitable for all types of concrete products. Write for our new color card, copy of "Suggestions For Using Cement Colors", and for free samples and price list.
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CEMENT COLORS
MORTAR COLORS
made by
BLUE RIDGE TALC CO., INC.
Henry, Virginia

Pallets
Racks
Lift Trucks
Block
Machinery

WITTEMANN MACHINERY COMPANY
FARMINGDALE, NEW JERSEY
Specialists in Concrete Products Equipment
Eastern Representatives of the
COLUMBIA MACHINE WORKS, Vancouver, Washington

Elevators
Bins
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Mixers

Power Sweeper For Sale practically new—used only 3 days. Tennant Model #75—Heavy Duty Power Sweeper, 7.3 H.P.—4 cycle, Air Cooled Gas Engine, Electric Starter, Generator, Storage Battery, 9 cu. ft. Dirt Hopper 12" Rubber Tired Wheels, 2 Speed Transmission, Heavy Duty Cleaner Cost $2,201.00. Will sacrifice.
Write: **SCRANTON BUILDING BLOCK CO.**
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Mutual 3-5900

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One Fleming FMC-180 Automatic Block Machine Complete with Motors and Controls, 4" and 8" Mold Boxes and Attachments.
FOB NORFOLK, VIRGINIA $1,250.00
ALSO
One Barrett Cravens Hand Lift Truck $75.00
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1—General Conveyor Bucket Loader, Barber-Greene type, Pneumatic Tires, Four Cylinder Wisconsen Engine $700.00
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Phone 900, Lawrenceburg, Ind.

FOR SALE
Complete block plant, operating every day. Two machines, Stearns #9, #7.
Full line of equipment, plant on leased ground, immediate possession.
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Quinn Tile Machine
4" to 12" Diameter
1'—Length
Excellent Condition
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1—28 cu. ft. Stearns mixer, complete with 20-H.P. motor and starter.
1—28 cu. ft. Stearns skip loader. 4", 8", 10" header and 16" open pilaster attachments.
Set-conversion parts for round and square corners and sash blocks.
1—30 yd. 2 comp. steel bin with weight batching equipment and 32' bucket elevator.
1620—plain steel pallets.
45—Steel racks with 72-block capacity.
Above equipment in extra good condition and may be seen in operation.
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12" mold box (new)
Approx. 2000 Pressed steel pallets 8"
Machine completely overhauled and can be seen in action.
Air off bearer
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You need more than good block to create a market for

CONCRETE MASONRY

First requisite for a successful concrete masonry business is making block that comply with applicable specifications for strength, dryness and absorption. But it takes much more to create a steady market for your block. It means:

—keeping architects, contractors and masons aware of the advantages of concrete masonry.

—supplying information to prospects; showing them actual installations, and furnishing names of architects, builders and lending agencies experienced in designing, building and financing concrete masonry construction.

—making on-the-job inspections to assure quality construction. The latest recommended practices are described in the new 64-page book, *"Concrete Masonry Handbook."* Send for your free copy, distributed only in U.S. and Canada.

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A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

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LITH-I-BLOCK'S MODERN FEATURES MEAN MORE HIGH QUALITY PRODUCTION AT LOWEST COST

PICK THE

LITH-I-BLOCK MACHINE

THAT'S BEST FOR YOU

ROTA-POSED® AGITATION — Interlocking fingers on three rotating shafts fill mold in a fraction of former time.

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HYDRAULIC or AIR POWER

IN EITHER

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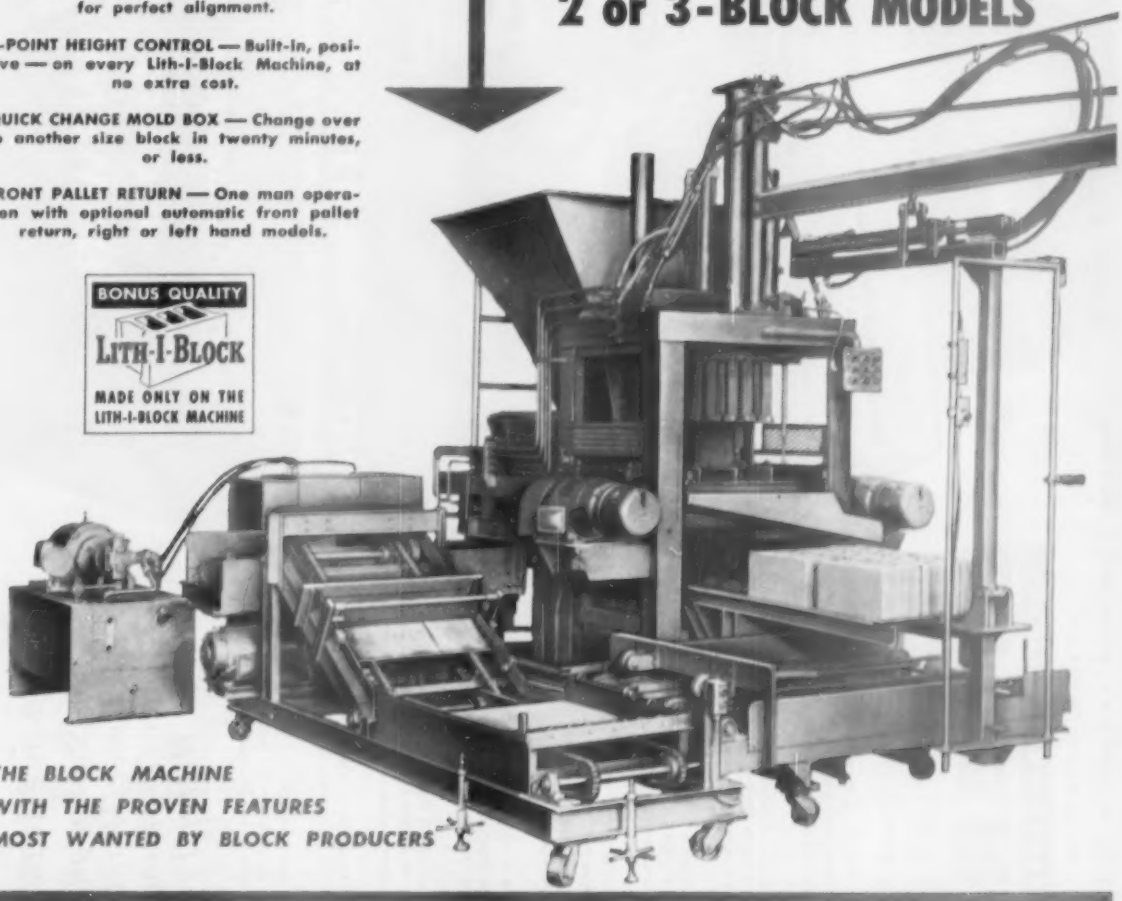
BONUS QUALITY
LITH-I-BLOCK
MADE ONLY ON THE LITH-I-BLOCK MACHINE



THE BLOCK MACHINE
WITH THE PROVEN FEATURES
MOST WANTED BY BLOCK PRODUCERS

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ONE PIECE OF EQUIPMENT OR A COMPLETE PLANT LAYOUT

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Send me latest bulletins on Lith-I-Block Machine.

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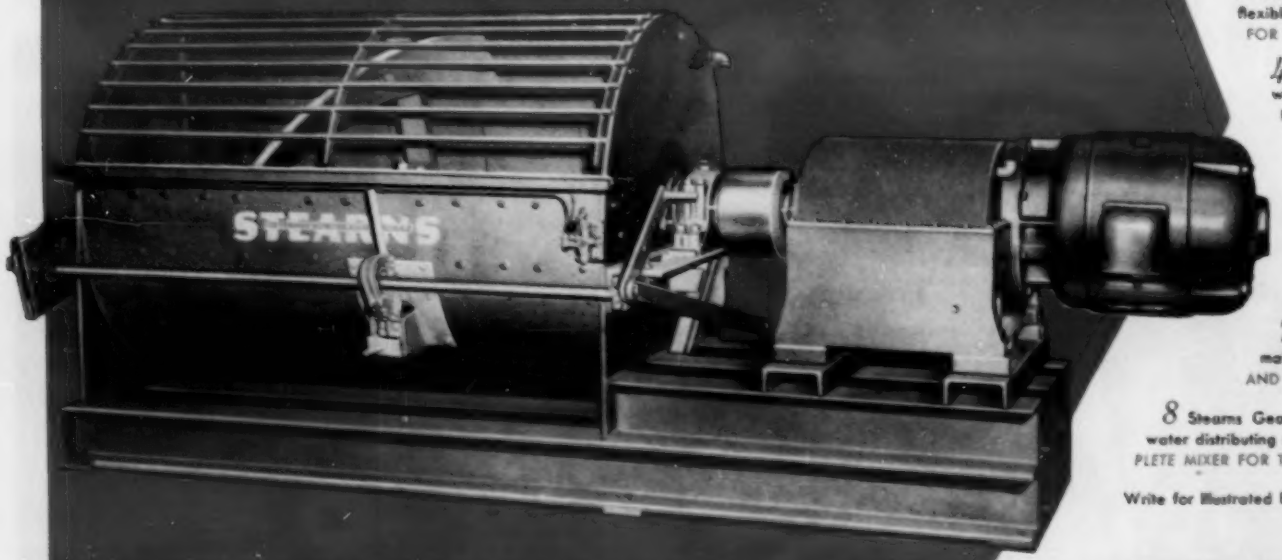
Mixing Problems and Maintenance Costs!

Products men . . . who *know* mixers . . . are changing to STEARNS Direct Gearmotor Drive!



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8 Basic Reasons why Stearns gives you . . . Lower Maintenance . . . Greater Operating Efficiency . . . Higher Profits!

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24" x 211 ft. with rollers 40 HP electric motor
42" x 1000 ft. with rollers electric motor drive
60" x 356 ft. and 60" x 600 ft. complete with rollers
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Telsmith 5'x12' dbl. deck elec. motor.
C. B. 4' x 12' dbl. deck Elec. motor.

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The money you are paying to keep wornout equipment working may be just enough for you to own better equipment.

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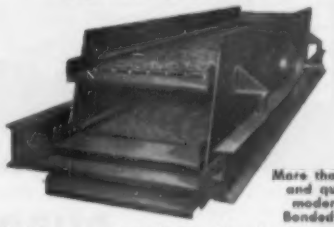
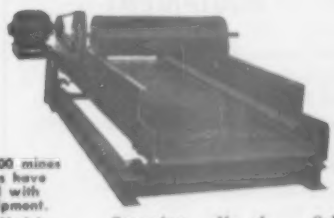
NEW BONDED® HEAVY DUTY VIBRATING SCREENS



More than 5000 mines and quarries have modernized with Bonded equipment.

Model Number	Screening Area	No. of Decks	Sale Price
138BS	3' x 8'	1	$1231
238BS	3' x 8'	2	1262
338BS	3' x 8'	3	1375
248BS	4' x 8'	2	1565
348BS	4' x 8'	3	2035
2410BS	4' x 10'	2	1953
3410BS	4' x 10'	3	2305
3412BS	4' x 12'	3	2635

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



Model Number	Screening Area	No. of Decks	Sale Price
124AS	2' x 4'	1	$ 443
224AS	2' x 4'	2	472
126AS	2' x 6'	1	472
226AS	2' x 6'	2	501
136AS	3' x 6'	1	581
236AS	3' x 6'	2	688
336AS	3' x 6'	3	954
148AS	3' x 8'	1	675
248AS	3' x 8'	2	815
348AS	3' x 8'	3	996

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry. HEAVY DUTY MODELS: "Type BS," 4-bearing, positive throw, eccentric shaft; 3'x8' to 5'x14', 1 to 5 decks. GENERAL DUTY MODELS: "Type AS," eccentric weight mechanism, spring mounted, 1 to 3 decks, 2'x4' to 3'x8'. Write for Bulletin 1086 & 1087.

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the BONDED CONVEYOR SPECIALS listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¼" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ¼" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	25'	$1397	$ 722
14"	50'	2222	1144
14"	85'	3277	1733
16"	20'	1262	636
16"	45'	2137	1085
16"	90'	3712	1900
18"	25'	1477	794
18"	45'	2217	1166
18"	70'	3142	1648
18"	85'	3697	1933
18"	100'	4252	2220
20"	25'	1517	828
20"	60'	2882	1533
20"	7b'	3467	1838
24"	25'	1590	896
24"	45'	2430	1330
24"	70'	3480	1875
24"	100'	4740	2514
24"	120'	5580	2950
24"	150'	6840	3603
30"	50'	2911	1617
30"	70'	3871	2119
36"	25'	1818	1118
36"	45'	2858	1675
36"	60'	3638	2096

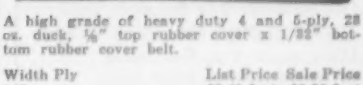
For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting.

For 14" belt ..... **$16.84 per foot**
For 16" belt ..... **18.04 per foot**
For 18" belt ..... **19.24 per foot**
For 20" belt ..... **20.37 per foot**
For 24" belt ..... **21.76 per foot**
For 30" belt ..... **24.75 per foot**
For 36" belt ..... **27.95 per foot**

Write For Bulletin #1138

NEW CONVEYOR BELTING

SAVE UP TO 25%

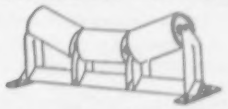


A high grade of heavy duty 4 and 5-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom rubber cover belt.

Width	Ply		List Price	Sale Price
14"	4		$3.43 foot	$2.75 foot
16"	4	12-15# aver-	3.86 foot	2.88 foot
18"	4	age friction	4.27 foot	3.19 foot
20"	4	pull, 800# to	4.69 foot	3.69 foot
24"	4	1000# average	5.55 foot	4.14 foot
30"	4	cover tensile	6.77 foot	5.06 foot
36"	4		8.01 foot	6.00 foot
16"	4	16-19# AFP	4.59 foot	3.36 foot
18"	4	2500-3000#	5.09 foot	3.72 foot
20"	4	ACT OR	5.57 foot	4.24 foot
24"	4	24-33#	6.56 foot	4.86 foot
30"	4	AFP with	8.05 foot	5.89 foot
24"	5	1800-2200# ACT	7.68 foot	5.61 foot

Additional widths and plies available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greasable type Alemite Fitted bearings at slight additional cost. Maintenance is negligible.

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9-W Bucyrus Erie Drag, 165', 10 yd.
625 Page Diesel Drag, 150', 10 yd.
625 Page Diesel Drag, 160', 9 yd.
6160 Bucyrus Monighan Elec. Drag, 160', 8 yd.
621 Page Diesel Drag, 135', 5 yd.
621 Page Diesel Drag, 125', 7 yd.
7200 Marion Drag, 120', 7 yd.
200-W Bucyrus Monighan Drag, 140', 6 yd.
2400 Lima Drag, 120', 6 yd.
4500 Manitowoc Drag, 140', 4 yd.
620 Page Diesel Drag, 115', 6 yd.
4500 Manitowoc Drag, 120', 5 yd.
120-B Bucyrus Erie Elec. Drag, 115', 5 yd.
111-M Marion Drag, 80' 5 yd.
1055 P & H Drag, 110', 4 yd.
1201 Lima Drag, 85', 3 yd.
3500 Manitowoc Drag, 80', 2½ yd.
1001 Lima Drag, 80', 2½ yd.
955 P & H Drag, 100', 2½ yd.
54-B Bucyrus Erie Drag, 85', 2½ yd.
80-D Northwest Drag, 65', 2½ yd.
170-B Bucyrus Erie Elec. 6½ yd. Shovel
1600 P&H Elec. 6 yd. Shovel
1500 P&H Elec. 5 yd. Shovel
120-B Bucyrus Erie Elec. 4½ yd. Shovel
111-M Marion 4 yd. Elec. Shovel
111-M Marion 4 yd. Diesel Shovel
1055 P&H 3½ yd. Shovel
1201 Lima 3½ yd. Standard Shovel
111-M Marion 3 yd. High Lift Shovel
1201 Lima 2½ yd. High Lift Shovel
3500 Manitowoc 3 yd. High Lift Shovel
80-D Northwest 2½ yd. Shovel
54-B Bucyrus Erie 2½ yd. Shovel
38-B Bucyrus Erie 1½ yd. Shovel
25 Northwest ¾ yd. Shovel
22-B Bucyrus Erie ¾ yd. Shovel
Unit 1020 ¾ yd. Shovel
802 Lima Cranes
600 Reich Heavy Truck Mounted Rotary Air Drills
(Both Lever Arm and High Mast)
58-BH Joy Champion Rotary Air Drills
Quarrymaster Drill—with 2-500 c.f. Compressors
Also 42-T, 29-T and 27-T Well Drills

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COMPRESSOR: Fuller 350 H.P. Rotary, 440 volt, capacity 1850 CFM @ 100 lbs., thoroughly modern, condition like new.
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CAR SPOTTERS: Capston type 7½ and 10 H.P., 220/440 volt.
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CLASSIFIER: Dorr 16' dia. with 8' x 35' tank.
HYDRO SEPARATOR: Hardinge 20' x 6' complete, like new.
CONE CRUSHER: Symons 2 ft. standard bowl.
FEEDER: Robins heavy duty, manganese steel, 60" x 14' with 20 H.P. motor, reducer, etc. NEW condition.
PAN CONVEYOR: 48" x 110 ft. complete with motor, reducer, etc., heavy duty type, designed for rock.
JAW CRUSHERS: 10" x 20", 15" x 36", 18" x 30", 24" x 36", 30" x 42", 42" x 40", with or without motors.
PULVERIZERS: Marcy 7' x 12' Rod Mills, open end type, modern design, new condition. Hardinge 8' x 48" Ball Mill.
HAMMER MILL: Jeffrey 36" x 60" type B.
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50' c/c 8x5 buckets, complete.
22' c/c 6x4 buckets on 7" belt.
26' c/c 8x6 buckets, steel case.

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4'x8' Kennedy Type M Ball Mill.
8'x48" Hardinge, Conical Mill.
8'x36' Hardinge, Conical Mill.
9'6"x12' Marcy Rod Mill.
5'x10' Allis Chalmers Tube Mill.
8'x10' Patterson Ball, Buhrstone.
20"x12" Jeffrey Hammer Style A, NEW.
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36"x48" Traylor "R" Jaw Crusher.

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5'x20'x¼" welded.
5' x 10-Hearth Furnace.
4'x40' Rotary Dryer, oil fired.
502-16 Link-Belt Roto Louvre.
502-20 Link-Belt Roto Louvre.
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Tyler 5 x 12, 3 x 10, Wet type.
Robinson Gyro Sifter 28A.
Gayco 18", with motordrives.
Rotex #21, 40" x 84".

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625 CFM I.R. Compressors 14x13.
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150 HP Union W.T. Boilers.
47' Screw Conveyor 12", 2 HP motor.

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2—Allis Chalmers 10″ Superior McCully.
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1—Dixie #3620 non-clog Hammermill.
5—NEW Jeffrey Hammermills 20″x12″, 8″x15″.

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5—Rotex 40″ x 84″, 40″ x 120″.
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2—Chicago 14″ x 7″ Compressors, 434 afm.
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12—Bucket Elevators 20′ to 75′ centers.
250 ft. Link Belt 12″ Troughing Conveyor.
1—10,500 gpm Centrifugal Pump 135′ head.

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1—Bucyrus-Erie 110 B, serial #113136, all electric, 5 yd. shovel. New 1955. Tip top cond. in Colorado, 100 miles S.W. of Denver. Price, loaded .....$140,000.

1—Bucyrus-Erie 54-B, serial #31388, 70′ boom, 2½ yd. dragline. New 1954. Shows little wear. Priced for immediate sale at Richmond, California .....$36,500.

2—Model 1201 Lima draglines, w/one shovel attachment to fit either machine, Serial #5269 & #5338, In Los Angeles, Good cond. Available Sept. 15, 1956. Price .....$46,500. $48,000.
Extra for shovel attachment....$ 7,000.

1—1055, P & H, comb. 4 yd. shovel & dragline, serial #14178, new 1951, equipped w/shovel attachment & 120′ dragline boom, fairleads & lagging. Cat. engine, Good cond. Price, F.O.B., L.A. $55,000.

1—N.W. 80 diesel shovel, new in 1948. Good cond. here in L.A. .....$30,500.

2—Koehring Model 605 cranes, serial #C9309 & C8818, w/extra long & wide crawlers, 80′ boom, fairleads, independent boom hoist, 2 yd. dragline bucket. Cat. D 13,000 engine. Purchased new July 1955. Price-Each .....$41,000.

1—Manitowoc Model 2000 B crane, serial #22298, w/extra long & wide crawlers, independent boom hoist, fairleads, 1½ yd. dragline bucket, G.M.C., 671 engine. New Nov. 1954. Price .....$30,000.

1—Manitowoc 4500, 6 yd. dragline, 120′ boom. New July 1950. 25′ 9″ crawlers. 60″ pads. Cat. D-386 diesel engine. Recently overhauled. Good cond., F.O.B., Albuquerque, New Mexico ....$88,500.

1—Lorain Model L 820 KS crane, serial #25842, w/3 yd. dragline, long & wide crawlers & 80′ boom. Waukesha Diesel. New Feb., 1955 .....$47,500

2—LeT. scrapers. 22 yd. FU. Trenton, Nebraska. Price-Each .....$ 2,000.

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3 yd. Esco Med. Wt., Los Angeles $ 1,800.

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Link-Belt LS-50 backhoe, gas power.
Buckeye 70 crawler clam, gas power.

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1—Euclid S-12 12-yd. scraper. New condition.
2—LeTourneau "D" scrapers. Excellent.
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6—Euclid 12-yard bottom dumps. Buda Diesel.
2—Euclid Tractors with 3200 gallon water tank, Semi-trailer.
2—Euclid Model 3BV Loaders.
3—Caterpillar DW-10 Scrapers. Reconditioned.
2—Caterpillar DW-15 Scrapers. Excellent.
1—Woolridge 15-18 yard, Model TCR Scrapers. Rebuilt.
Cat D8 with winch.
1—Allis-Chalmers HD19 with Carco Blade. Excellent condition.
International TD24A with B-E angledozer.
1—Allis-Chalmers HD10 with Baker Bulldozer Blade.
1—International TD18 with Bucyrus-Erie Bulldozer Blade. Excellent condition.
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Caterpillar D7700, 63 H.P. @ 1000 RPM. Rebuilt.
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13x34, 13x30, & 18″x36″ Farrel Blake Jaw.
9½″x15″ Dodge Lever Type Jaw, Rebuilt.
27½ Kennedy, 550 Volts Connected.
38½ Kennedy Belted Gyratory.
36″—20″ & 10″ Allis Chal. Superior McCulley.
#9—7½—6—4—4K Allis Chalmers Gyratory.

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15 Ton Diesel 60′ Boom Whirley Crane.
3—65 & 44 Ton G.E. Diesel Elec. Locomotives.
10 Ton Plymouth Diesel Locomotive.
100, 35 & 25 Ton G.E. Diesel Elec. Locomotive.
35 Ton Amer. Diesel Loco. Crane, 80′ Boom.

REDUCTION MILLS

12 Rod Mills 30″ x 54″, 6′ x 14′, 5′ x 10′, & 6′ x 12′ Denver, Marcy & A.C.
45 Ball Mills: 3x6′, 3x7′, 4x5′, 5x8′, 6x10′, 6x18′, 6x5′, 6x8′, 6x10′, 6x9′, 7x5′, 7x6′, 7x7′, & 5 Marcy 66.
29—Hardinge Mills: 10′x48″, 8′x10″, 8′x36″, 8′x22″, 7′x36″, 6′x36″, 6′x22″, 6′x14″, 5′x36″, 5′x24″.

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19—4′x28′, 6′x28′, 7′x110′, 9′x125′ & 10′6″x105′.

ROTARY DRYERS

2′x26′, 4′x20′, 5′x25′, 4′6″x40′, 10′6″x80′.

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416 CFM Ingers. Rand 90B—100HP—440V.
1578 Inger. Rand PRE2—4100/3200 V.
2—2874 Inger. Rand PRE3—478 HP, 2300 V.
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DRYERS

1—4½' x 30', 7' x 60', 8' x 120'.

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1—48" x 42", 24" x 36", 18" x 36", 15" x 30", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls, rebuilt. 36" x 16 rebuilt Sturtevant rolls.
3—24" x 14" Rogers Iron Works Crushing Rolls, Rebuilt.
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Used rotary kilns located east of the Mississippi River.
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___Bin Level Indicators
___Bins and Batching Equipment
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___Blasting Supplies
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___Bodies, Trailer*
___Brick Machines and Molds
___Buckets*
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___Cars, Industrial
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___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
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___Vibrators
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Firm Name_____
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RP-10-56

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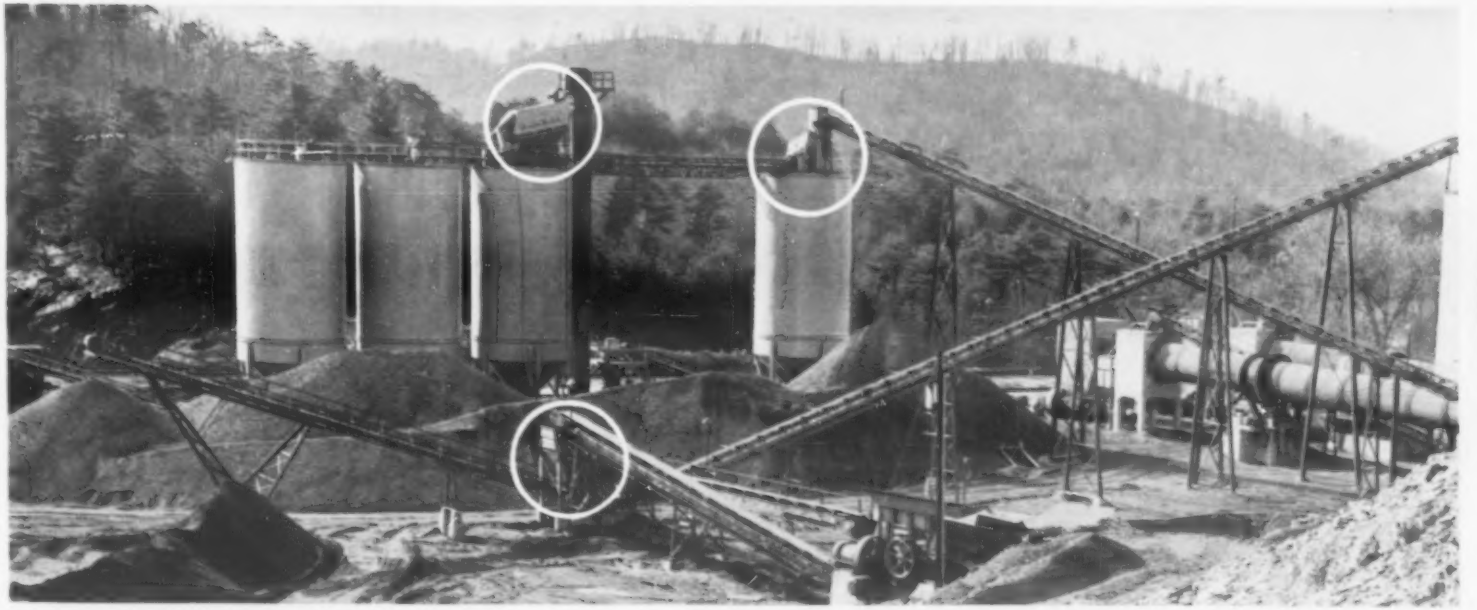

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